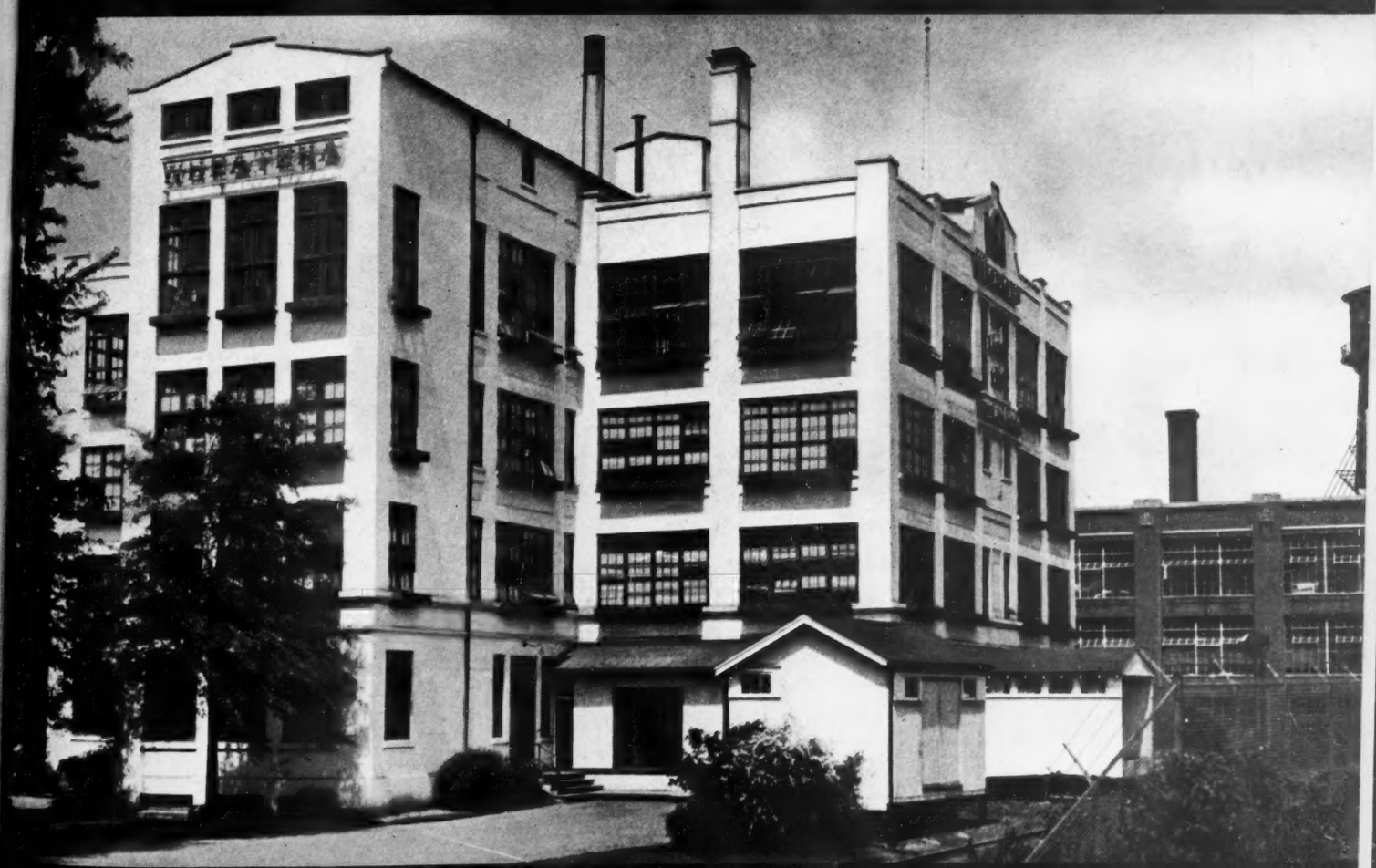
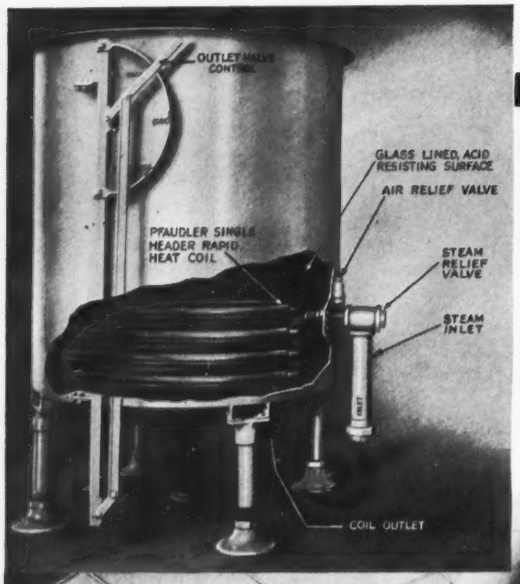
FOOD INDUSTRIES

JULY 1938



HOMES OF FAMOUS FOODS . . . . WHEATENA



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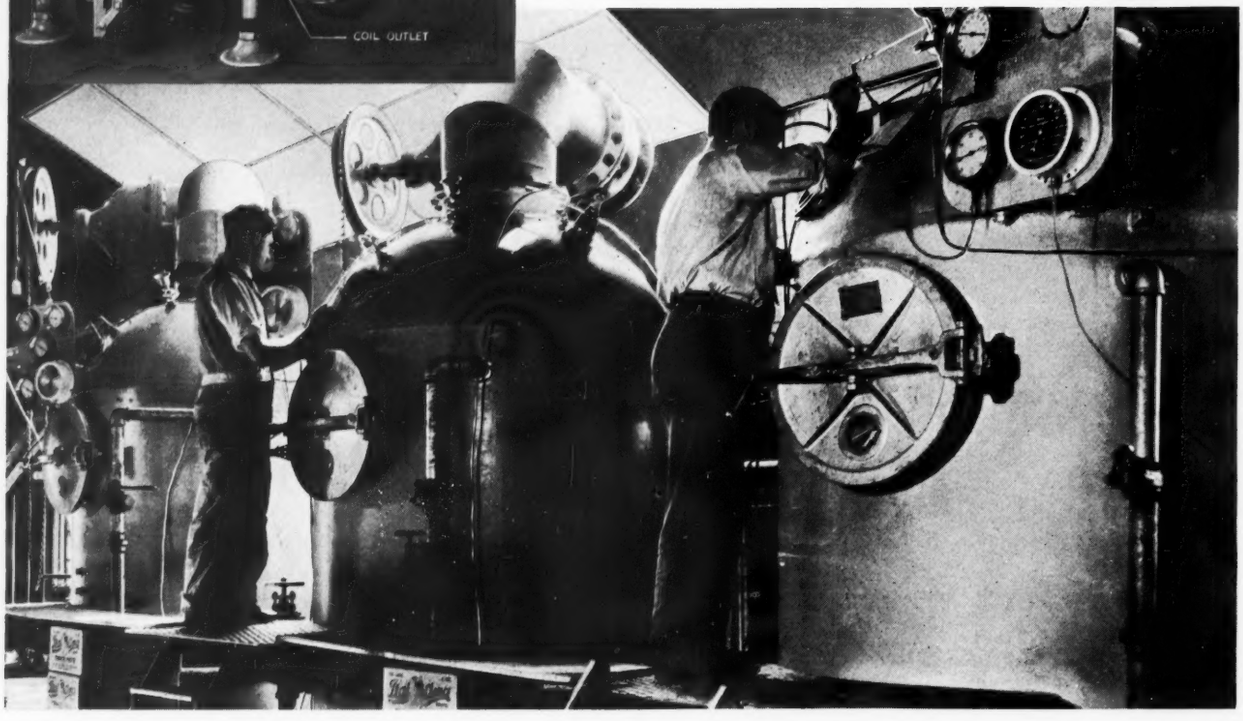

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FOOD INDUSTRIES

DISTRIBUTION · PROCESSING

PUBLISHED MONTHLY

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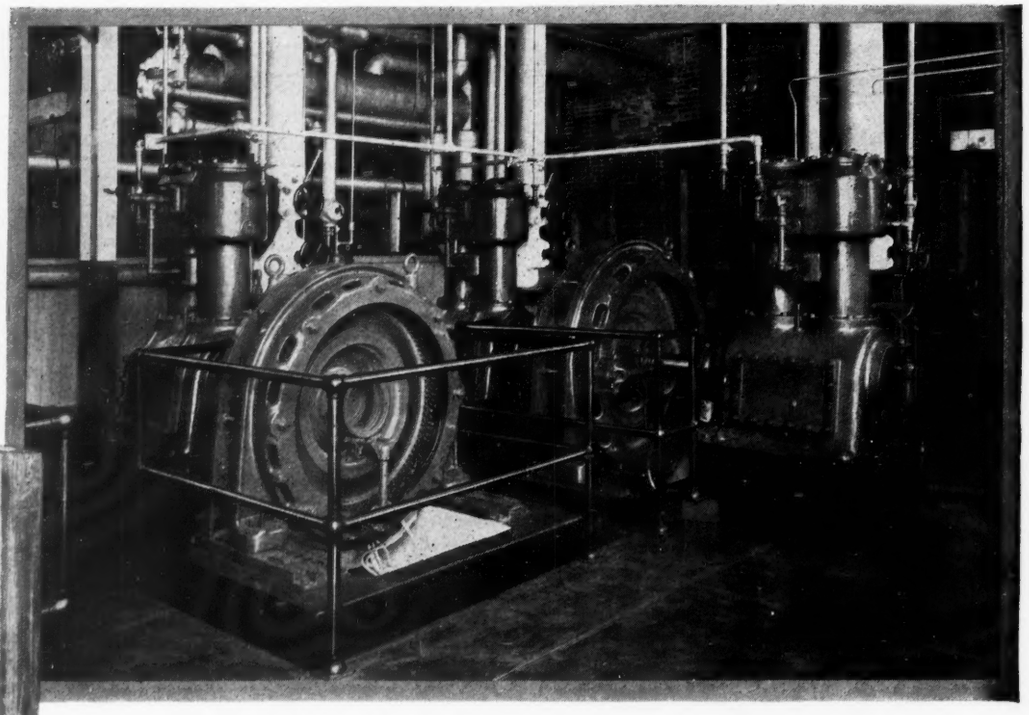
OILS *THAT STAY WHERE THEY'RE* *needed!*



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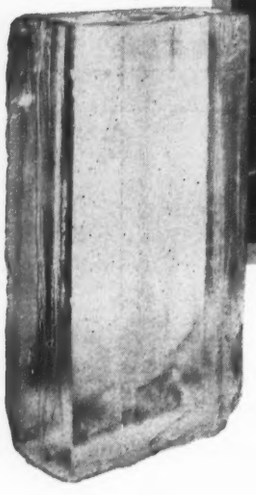

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FOOD INDUSTRIES

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Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 10, No. 7

Laurence V. Burton, Editor

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JULY 1938

The Talk of the Industry

» HYDROPONICS NOTES—An ad in a New York daily tells how to get rich by selling soil-less agriculture, or hydroponics, outfits to hobbyists for one dollar per each. The name is Chemi Grow, located in Los Angeles. Go ahead, get rich—and see who cares.

» THE HOME MARKET, the one just in front of our noses, is often the one to be neglected. Coffee-producing countries are now striving hard to persuade the United States to consume more than our present (1931–32 average) 12.92 lb. per capita of coffee. Yet Brazil, the largest coffee producer in the world, only consumes 5 kg. per capita (about 10 lb.) according to the U.S. Department of Commerce.

» A NEW FENCE is being built around the White House. It is twice as high as the old fence. Reason: too many people have been climbing the old fence into the forbidden part of the White House grounds on which the President's office-windows open.

Well-upholstered club members are too fat to climb fences, and business men don't do such things. So the growing tribe of trespassers must be New Dealers. But, if so, why the higher fence?

» IT BEGINS TO APPEAR as though we would have to be very careful about our comments on various foods in this department. A while back, we made a wisecrack about peanut hams, and in came a ham from Swift's plant in Moultrie, Georgia. It was as tasty a morsel as was ever laid before a discerning critic. If you want the ultimate in ham, the peanut ham has it.

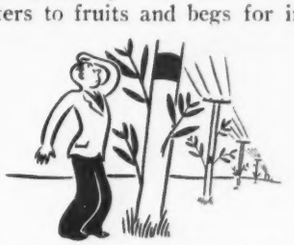
Next, when we were so incautious as to comment on the difficulty of procuring good Philadelphia scrapple away from Philadelphia, Armour & Co. sent us a goodly shipment just to prove that excellent scrapple can be made in Chicago. We wouldn't dare to say a word about lunch tongue, liverwurst, or roast beef.

» THE PRESIDENT'S COMMENTS at Arthurdale on the recently enacted Tax Law indicate no change in his attitude toward business. Which is not surprising to those in the know. But it was a bit surprising to discover that he had the audacity to put out misleading statements which he must have known were not true. Heretofore, such "misrepresentation" has been reserved for smaller audiences in his own office.

» HENRY GRADY, of the Federal Trade Commission, is expected to bring forth some new reciprocal trade agreements with the United Kingdom, Turkey and other countries. Food producers and manufacturers of the United States have been apprehensive lest domestic apples be traded for British fish, U.S. mechanical goods for Turkish figs and other dried fruits, and similar foods from foreign lands which, alas, we produce in abundance ourselves. There seems to be slight expectation of curtailing the inbound flow of Polish cured meats, or creating conditions that will permit us to regain our former position in Great Britain.

If Mr. Grady succeeds in the schemes which have been imputed to him, it is doubtful if he will ever dare show his face in California or New England.

» FROM THE VIEWPOINT of the man who is interested in the raw materials supply of his branch of the food industry, 1938 is a strange year indeed. News dispatches from abroad during the early spring have told of killing frosts. Now we hear of European drought. A recent letter from France almost piteously recounts the frost disasters to fruits and begs for information as to where frozen fruit may be purchased.



On the other hand, the picture is vastly different in the United States. Here the news dispatches inform us of an astonishing amount of rainfall and subnormal temperatures. One town in Illinois had 27 days of rain in May. Floods in Oklahoma and Arkansas. Tremendous grass crop. "Sprouting telephone poles." Greatest wheat crop in history is the forecast—but, of course, the crop has not yet been harvested. Wisconsin and Minnesota peas are doing splendidly. Minnesota feels the pinch of excessive butter production and is trying to find a way out from under.

What is the explanation of all this? How long will the cool, wet weather

continue? Your guess is as good as ours.

Nevertheless, it is suggested that you get out your January, 1938, number of FOOD INDUSTRIES and reread "What Will the Weather Be?" If the weather of 1938 really turns out to be something of a repetition of 1915 weather (based on the 23-year cycle theory), you can expect a cool wet summer until the end of August.

What will this do to raw material supplies and market? Our counsel is, not to be dismayed by bad news (for if you are, you are licked), but to play safe—to think it through and have a long-range program.

The Outlook

ONLY AN INCURABLE PESSIMIST will deny that a pendulum swinging swiftly in one direction will return at the same rate. Only an incurable pessimist will deny that recovery from Mr. Roosevelt's present New Deal-made depression will probably be just as swift as the decline.

Just a year ago an equipment maker was making personal calls on his own salesmen to make them stop promising 90-day deliveries. Only a year ago steel sales were considerable over 100 per cent of the existing rate of production.

Wages and Living Cost

ABOUT FOUR or five years ago, Dr. Fredrich C. Howe, who was then Consumers' Counsel of AAA, complained rather bitterly to this department that the cost of living was going up exactly parallel to the increase in wages paid. Seemingly, he believed that wages could go up without any increase in costs or prices.

To such complaints there is but one answer: life is living. If it did not cost practically all that any of us can make, in order to live, whom could we get to work?

As total wages go down, so must prices; and, contrariwise, as total wages go up, so must prices. It was ever thus, and it always will be.

Where Are The Regulations?

FOR MANY MONTHS FOOD INDUSTRIES has been studying regulations issued by various state administrative bodies charged with enforcing their respective state food laws. It's like pulling teeth to get some states to tell what *all* their regulations really are. Which recalls that one of the reasons why the U.S. Supreme Court kicked out some NRA decisions was that nobody could find out what was required for compliance with the law. In one case, it developed that the only copy of the regulations was in the pocket of one man.

Better Raw Materials

IT LOOKS AS THOUGH a good many food manufacturers have got to be expert agronomists; or perhaps they should hire an agronomist to help them. The object is, of course, to get better quality of agricultural raw materials and to get them regularly, and perhaps even to get them cheaper.

For a good many years certain food manufacturers have contracted with farmers to grow the necessary raw material, and have supplied the seed and free advice to insure getting the desired type and quality of product. It is evident that a great many more companies should do something like this. And the job should be much more completely done than it is at present being done, except perhaps by a very few firms.

The cost of raw material in a good many concerns is the largest single factor in total cost. As various farm-aid programs progress, and as the agricultural relief plans of Uncle Sam become more elaborate (as they will), this problem gets worse for the food men. The only answer is to go right to the root of the difficulty, and not depend on casual or occasional methods to insure regular supply of the highest quality raw material that can be had.

Full execution of such plans may even make food executives into entomologists also. Certainly a full program of planning and protection of raw material supply would often include the selection of seed, provision of fertilizer, instruction of farmers as to proper culture, and supply and use of requisite insecticides.

All this sounds very complicated and costly. It might be both without compensating advantage. But in a

Hors d'Oeuvres

• Latest in promotion periods is "Drink More Milk Month," which began June 10. The dairy industry is conducting a current campaign with lots of cow appeal, and, we are assured, no bull. But, then, what's cow appeal without bull?

• *More than 2,000,000,000 lb. of candy was eaten in 1937. Looking back, it was a pretty sweet year at that.*

• A seal of approval of American Animal Hospital Association is being placed on canned dog food. The seal denotes deletion of deficiencies in the diet of the domesticated dog. Hot diggity!

• *Wisconsin now produces a mere 55 per cent of the nation's cheese, as compared with 75 per cent in 1920. And in the future the percentage is expected to be even less. So Wisconsin, deprived of its boast that it makes the most cheese, is getting ready to claim that it makes the best. You just can't keep a good state down.*

• A new citrus fruit has been developed in Jamaica by crossing the tangerine and the grapefruit. It is known as the "ugli." Why? Probably because it resembles "half a deflated football."

• *It was recently ruled in Wisconsin that a cream puff without cream is no cream puff. But what is cream? For instance, there's 20-per cent cream, 40-per cent cream, sour cream, marshmallow creme, face cream, shaving cream, ice cream—and if we keep this up you'll scream.*

• Ever hear of thistle oil? No? We never either. But the Department of Commerce has. It reports successful experiments in Uruguay in the extraction of a high-quality edible oil from seeds of the wild thistle. The wild thistle grows abundantly all over Uruguay, where the people may soon be thistling at their work.

• *The man making the most money from potatoes is not in the food industry. He's a writer of ultra-modern fiction, Damon Runyon, whose underworld characters are always out after more potatoes. Commenting on the great public interest aroused in England by his slaughter of Shakespeare, he said that all it meant to him was more potatoes.*

• New uses for cabbage are being sought by National Kraut Packers Association to combat the recession. If business keeps on receding until election, there will be a good market for slightly used cabbages that are still firm enough to get a grip on.

• *In the year 8113 A.D., posterity—if improved efficiency in eradication of* homo sapiens *permits of posterity at that distant date—will open a subterranean vault at Oglethorpe University, near Atlanta. In this vault will be found a 60-century old record of present-day civilization. Among the many products in the vault will be chewing gum. And immediately your great-to-the-nth-power grandchildren will conclude that you were a ruminating animal, probably a bull.*

great many cases the reputation for quality products cannot be maintained without regular supply of quality raw material. Such high quality raw material does not merely happen. It must be planned. Planning requires hard work and some investment, but with excellent prospect of lower cost and better quality as the reward.

Twenty-five Jobs Gone Forever

WITH THE Wages and Hours Bill just on the statute books, it is impossible to guess what its ultimate results may be. Yet some very definite reactions have already occurred in the Southern States, merely as a result of the struggle to enact the bill.

At a small Southern food manufacturing plant, the typical reaction occurred. Here was a small factory employing at a maximum only 80 persons. Previously an immense amount of push trucking and plain "toting" had been utilized in all its material handling. Conveyors had not been used until 1938 because labor was so cheap. Now the place is almost completely mechanized.

"If we must soon pay Northern wages, we will have to utilize Northern methods. We are not going to get caught with our pants down," explained the management. "We have eliminated 25 jobs by those conveyors. And if I hadn't made one of them four inches too short we'd 'a' made it 27 jobs."

Judging by the general appearance of the surrounding country, those 25 negroes who have been replaced will be a long time finding other jobs.

There are times when it appears as if the efforts of Northern Congressmen to enact wages and hours legislation, without permitting regional wage differentials, were a furtive attempt to prevent the trend of food manufacture toward Southern States.

Consumers Catch "Wholesale-itis"

AFTER READING the address of B. F. McLain, president of Hart Furniture Co., on the distribution side of the problem of regulating competition, at the annual meeting of the Chamber of Commerce of the United States, one concludes that he did an excellent job in analyzing this very vexing problem. His effort was to prove the unwisdom and unfairness of permitting consumers to buy at wholesale prices lest they become imbued with wholesale-itis and ultimately tear down the whole distribution system.

Strenuous efforts that many persons make in this direction of saving on retail distribution costs give ample evidence of a widespread human trait and desire to shorten the distance between producer and consumer. And, without question, the food manufacturing and distributing industries have come closer to satisfying that craving than any other industry.

Indeed, there are examples on every side to show that consumers can purchase foods at less-than-wholesalers'-prices in any thickly populated community. This condition is probably one which the public does not realize, but it evidently gives the consumer a taste of "blood" every day. And he finds it pleasing. This may not put the food industries middlemen "on the spot," but it certainly puts them on the defensive.

To Schools of Home Economics

DURING THE PAST FEW MONTHS we have been besieged by charming young ladies looking for industrial jobs as home economists. Also, quite a few of the applicants erroneously surmise that FOOD INDUSTRIES maintains a diet kitchen, a nutrition department and a food-research laboratory in which they should be able to find employment.

After the experiences with the current deluge of home economists, we are beginning to wonder what is the purpose of a course of training in that profession? We admit that we have harbored the quaint notion that such a training is to make better home makers, either through their own efforts in a home or by teaching the subject in secondary schools. Apparently we are miles behind the times.

Something seems to be wrong in their instruction as to the market for their services—Industry, to be sure, employs a few—though we doubt if as much as one per cent of the Home Ec. graduates can find industrial employment. And in this field the needed qualifications for a good job involve a whole lot more than mere ability to whack up a good meal. A considerable knowledge of sales promotion, advertising, public speaking and public relations is also indispensable. Still more important, we doubt if very many food manufacturers, aside from the best known and most successful, know how to make effective use of a home economist any more than they know what to do with a research chemist—or even a control chemist—to make money from his services.

Too Much Taxation Reduces Revenue

WHEN YOU STOP to think about it, the percentage of the population which can and does contribute real money directly to the support of government is rather small. Upping the taxes on them works all right for a while, but soon their limit is reached. And then, higher rates do not produce more revenues, but less, because there are still fewer who are able to pay.

The same phenomena is true of excise taxes. Place the tax rate too high, consumption falls off, and revenues are decreased. It has worked that way in England during the past twenty years where increasing the taxation on beer caused the per capita consumption to drop from 80 liters to 49 liters, and total revenues from this source actually declined.

After all, high prices are high prices whether due to high costs, big ideas as to values, or high taxes. And the effect on volume is just as detrimental from one cause as another.

Stopping the Air-Conditioning Hoax

UNIT HEATERS and unit coolers have an important function in many plants, but their use individually is not true air conditioning.

Air conditioning is an engineering term that has been carefully defined by the American Society of Heating and Ventilating Engineers. The term covers accurate control of temperature, humidity, rate of air movement, dust removal, odor removal and bacterial removal. Omission of any of these removes the operation from the field of true air conditioning.

Industrial air conditioning is usually installed to achieve an industrial result irrespective of human comfort. Sometimes, however, comfort is the aim of the installation. In so-called comfort air conditioning the same controls are prerequisite that are needed in process air conditioning, but the control instruments are adjusted to give maximum human comfort. Knowing this fact, it is ridiculous to see some of the fantastic claims made by makers of household devices (and certain uninformed industrial users of unit heaters and unit coolers) which cannot possibly control all of the six factors involved.

Recently the Federal Trade Commission has issued a cease and desist order to those who have perpetrated this technical hoax. For which, Allah be praised! We have troubles enough now without needing to unlearn misinformation.

Keep the SPORES *Out*

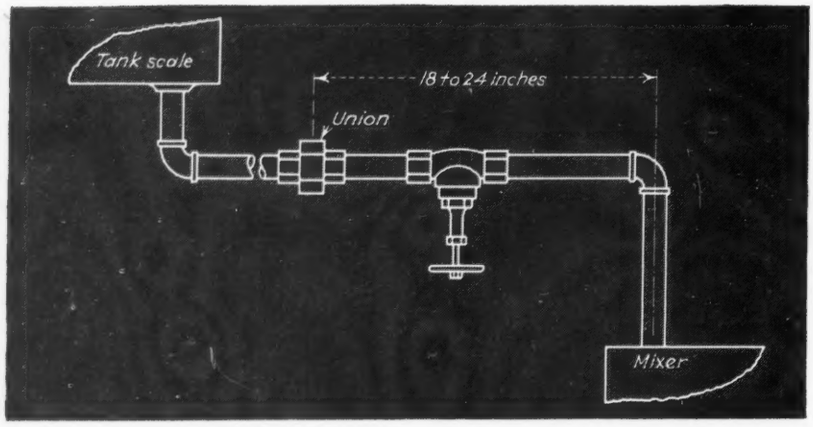


Fig. 1—A union placed in the pipe line between tank scale and mixer makes for easy and regular cleaning of flour accumulations out of wet pipe, thus reducing likelihood of "rope" infection of dough batches. Screwing el pipe out of valve permits thorough brush cleaning of el pipe where most flour accumulates. Except at union, dismantling of pipe line can be done without use of wrench.

Through the use of mechanical aids for cleaning equipment and of germicides for sterilizing production areas, "rope" infection of bread doughs may be prevented.

By

GERALD K. ASHBY *

and

PAUL S. PRICKETT

Mead Johnson & Co., Evansville, Ind.

"COUNT THE SPORES" (FOOD INDUSTRIES, April, 1937, pp. 178–180),[1] so fully describes and illustrates "ropiness" in bread and directs attention to some of the methods of control that it is not necessary for us to repeat such information here. However, two possible methods of control were not mentioned. One is mechanical in character; the other is chemical.

The first of these methods, probably overlooked by most bakers, has to do with keeping properly clean the pipe leading from the tank-scales to the mixer. The importance of this can be realized from the results of a survey of approximately 75 bakeries in East Texas. The survey included all types of bakeries. In every bakery where a tank-scale was directly connected to the mixer the connecting pipe was found to be grossly infected with bacteria.

This pipe becomes thoroughly wetted inside when water is added to the mix. As the mixing proceeds, dry flour in the form of dust finds its way into this pipe and sticks with a tenacity that is almost unbelievable. The resulting accumulation acts as a favorable medium in which bacteria may multiply. The accumulation finally becomes so large and the gluten of the flour becomes so broken down by bacterial decomposition that the accumulation begins to slough off. The broken off pieces are washed into subsequent dough mixes which are in this way infected by thousands of bacterial spores capable of producing "ropiness" in bread.

This condition was corrected in at least one bakery by installing a union in the pipe (Fig. 1) so that it could be easily taken apart and thoroughly cleaned. The installation of the union in this bakery has proved to be effective and practical under actual operating conditions. An ideal installation would be of sanitary piping as used in dairies.

The second method of control against "rope" not mentioned in the "Count the Spores" article is the use of germicides.

Daily use of germicides in all bakeries to control "ropiness" is a commendable although not a generally observed practice. However, there are times when the use of germicides becomes a necessity.

Obviously, a germicide as poisonous and as much feared by the public as bichloride of mercury or substances with odors as penetrating and persistent as the phenols or cresols cannot be used. Further, the efficiency of a germicide, as well as its effect on the bacteria that produce "ropiness" and also on the bakery personnel and equipment, must be considered.

* Former Industrial Fellow for American Soya Products Corp., Evansville, Ind., at A. & M. College of Texas, College Station, Texas.

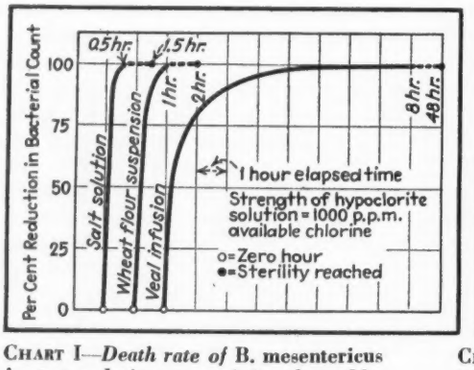


CHART I—*Death rate of* B. mesentericus *in test solutions containing hypochlorite "A."*

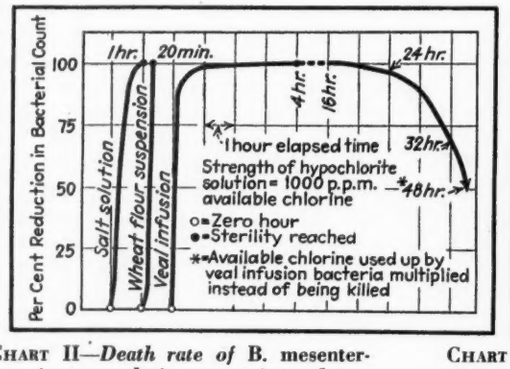


CHART II—*Death rate of* B. mesentericus *in test solutions containing hypochlorite "B."*

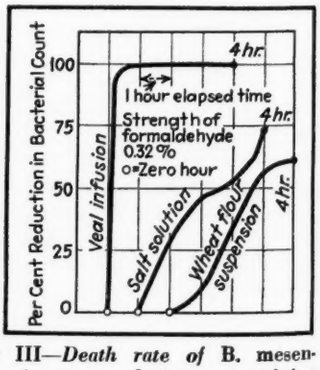


CHART III—*Death rate of* B. mesentericus *in test solutions containing formaldehyde.*

▶ *Mechanical conveniences for the thorough cleaning of pipe lines and chemical means of destroying "rope" spores have practical application in*

Baking	**Milk handling**
Brewing	**Olive pickling**
Flour milling	**Pickle making**
Dairying	**Sauerkraut making**
Malt extracting	**Wine making**
Meat curing	**Yeast growing**

After elimination of all compounds that are unsuitable because of toxicity, odor, or color, there remain only a few germicides that may be used in a bakery. Among these few are hypochlorites, vinegar, and formaldehyde.

In our study of methods of combating "rope", we found that if the bacteria capable of producing "ropiness" are actively growing, vinegar does have a germicidal effect upon them, even though the concentration of acetic acid in the germicidal solution is as low as 1 per cent. However, if the bacteria are in the resting or spore state, vinegar containing as much as 2.5 per cent acetic acid has no effect on them other than to keep them from becoming active.

Because bacteria in the spore state are more resistant to germicides and because bacteria capable of producing "ropiness" are present in bakeries in the spore state more often than in the vegetative state, the effect of hypochlorites and of formaldehyde on the spores impresses us of having industrial merit.

In practice, there is only one way in which hypochlorites may be used effectively in a bakery. They should be in solution. However, the solution may be used either as a spray or as a rinse. A rinsing solution containing 1,000 parts of available chlorine per million parts of water is highly effective against the spores provided there is no organic material such as sugar or grease present in the solution. The presence of wheat flour in the rinsing solution does not seem to interfere with the effectiveness of the hypochlorites.

The several species of bacteria

(*Turn to page* 414)

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3. See also "Effect and Efficiency of Germicides and Fumigants on Microorganisms Associated with the Baking Industry"—J. Bact. 32, 84 (1937), by Ashby, Hedges and Gibbons.

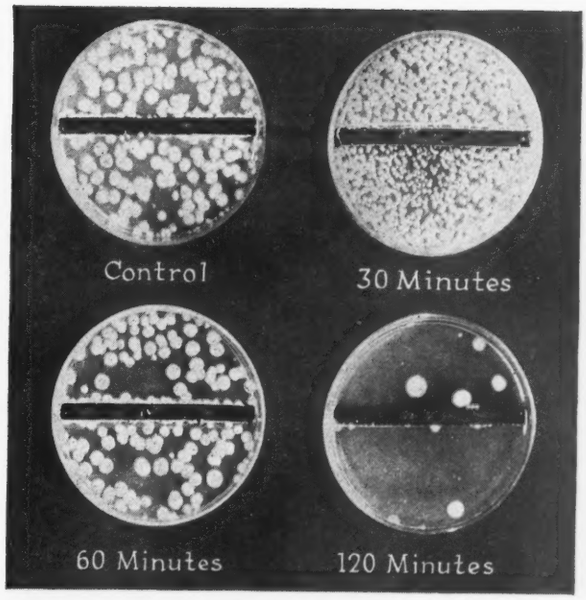


Fig. 2 — Hypochlorite solution when used as a spray and containing 1,200 parts per million of available chlorine is effective in destroying B. mesentericus *Trevisan on wood. Time given under each plate is time of exposure to hypochlorite.*

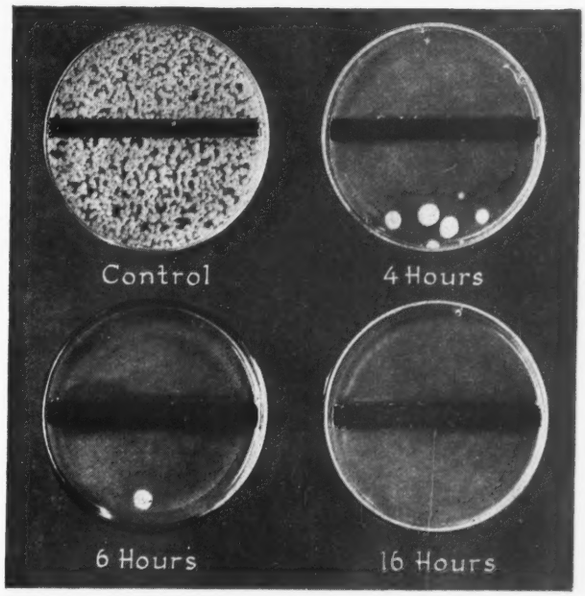


Fig. 3 — Formaldehyde when used on the basis of 3 oz. of candle per 1,000 cu.ft. of space treated requires approximately six hours of exposure to destroy B. mesentericus *Trevisan on wood.*

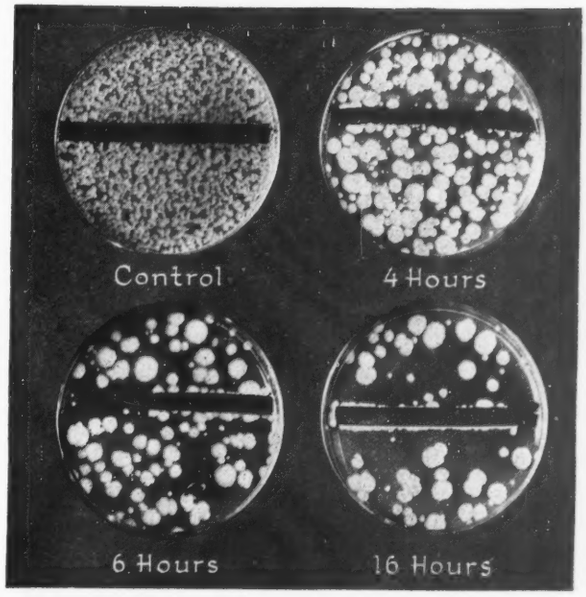


Fig. 4—When wood carrying B. mesentericus *Trevisan is coated with melted shortening, formaldehyde is not an effective germicide even when used on basis of 3 oz. per 1,000 cu.ft. of space treated. Time given under each plate indicates exposure of formaldehyde gas.*

AUTOMATIC CONTROLS
Improve Boiler Operation

Regulators in salt plant synchronize rate of steam generation with plant demand and control fuel-air ratio for high efficiency

By CHARLES W. PARSONS
Engineer, Republic Flow Meters Co., Chicago, Ill.

NATURAL GAS recently became available at the Worcester Salt Co. plant at Silver Springs, N. Y., and it was decided to equip one of the boilers to burn either gas or coal, the latter being instantly available in the event the supply of natural gas fails or becomes inadequate or uneconomic. Accordingly, a gas supply line was installed, and the boiler was equipped with two Riley combination gas and pulverized-coal burners. At the same time, a complete system of Smoot automatic combustion control was installed to provide the necessary automatic regulation to coordinate the operation of the boiler with the demand for steam and further to insure safety of boiler operation when burning gas fuel.

To supply the steam for the vacuum evaporation of salt and for other processes, a number of boilers have been in operation in the Worcester plant, most of them fired with coal by underfeed stokers and generating steam at 200 lb. per square inch pressure and 400 deg. F. total steam temperature. This steam is used in steam engines driving electric generators and exhausting to the processes, make-up steam being supplied from the 200-lb. headers through reducing valves when needed.

The boiler that has just been converted to gas fuel is a Riley three-drum bent-tube unit fired with pulverized coal supplied by three Riley Atrita unit pulverizers. Forced- and induced-draft fans driven by steam turbines supply the air for efficient combustion of the fuel, while boiler feed water is pumped by steam-driven feed pumps.

The automatic combustion control system operates to control the amount of fuel and air supplied to the furnace, so that sufficient fuel will be supplied to generate the amount of steam required and maintain constant steam pressure. At the same time it proportions the fuel and air so that the most efficient combustion is obtained over the entire range of load.

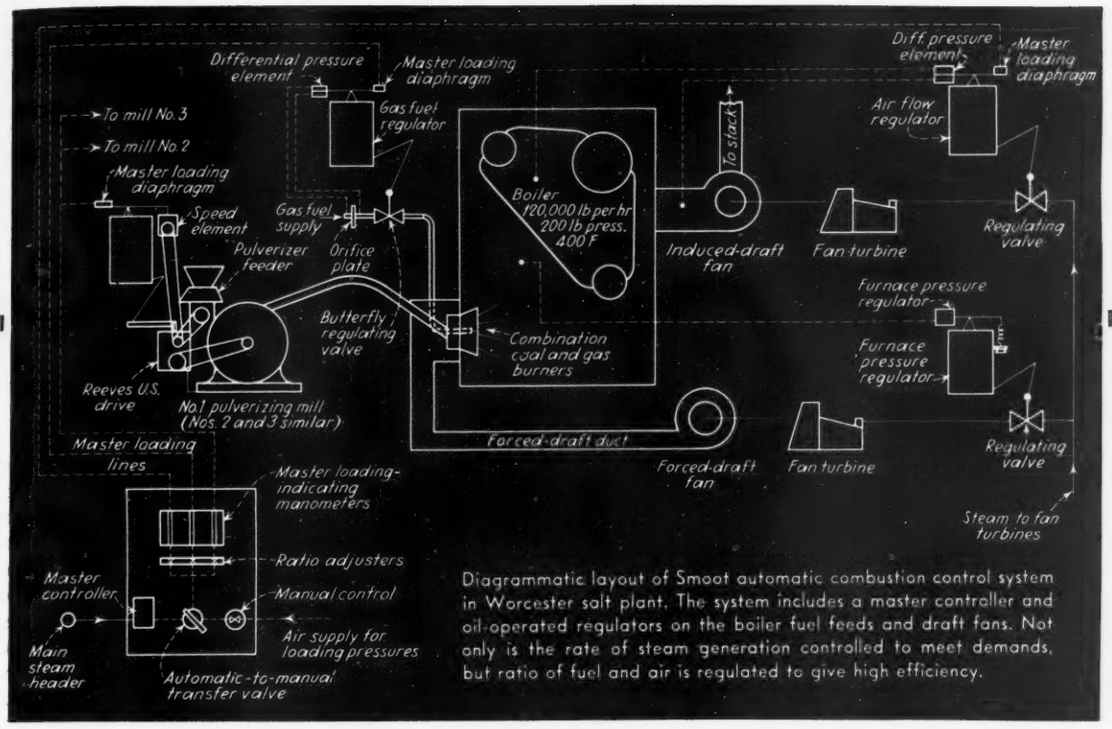
The control system consists of a master controller and four regulators, one on each pulverized-coal feeder, one on the gas supply line, and one on the steam supply line to each of the turbines driving the forced- and induced-draft fans. (See diagram). The master controller is actuated by the pressure in the main steam header and it in turn controls, by air pressure, the coal, gas and induced-draft regulators. The forced-draft regulator is not connected to the master controller, but it must be synchronized with the fuel feed and induced draft to give efficient operation.

Each of the four regulators is oil-operated. They are actuated by pressure-sensitive diaphragms connected to a weigh-beam pivoted on a fulcrum. The diaphragms unbalance the weigh-beam on its fulcrum in response to variations in the controlled element and in response to air pressure applied by the master controller. Movement of the weigh-beam in turn operates a hydraulic piston through an amplifier system and a pilot valve. This piston opens or closes the valve or damper under control.

The variations in the steam pressure in the main header constitute a measure of the amount of steam flowing from the boiler. These variations actuate the pressure responsive device in the master controller, which is connected so that air-loading pressures, varying in direct relation to the variations in steam pressure, are sent to the various oil-operated regulators governing the individual units of equipment supplying the fuel and air. In each regulator, the controlled quantity, flow of fuel or air, is measured by forces derived directly from the controlled quantity and impressed on a diaphragm, which is balanced against the master loading diaphragm on the weigh-beam. When this loading pressure varies, calling for an increase or decrease of the controlled quantity, the weigh-beam is unbalanced and its movement, through an amplifying system, controls a powerful hydraulic system to operate a valve, damper or other element to adjust the controlled quantity. When this has been brought to the proper value to meet the new conditions, the regulator will have returned to equilibrium and the controlled valve or damper will be in a new position to maintain the new conditions.

The flow of gas fuel is controlled in accordance with the master loading impulses by a regulator operating a butterfly valve in the gas supply line ahead of the burners. Supply of pulverized coal from the three pulverizers is controlled by varying the speeds of their respective coal feeders. Each coal feeder is driven through a Reeves variable-speed drive and the feeder speed is varied by an adjusting lever

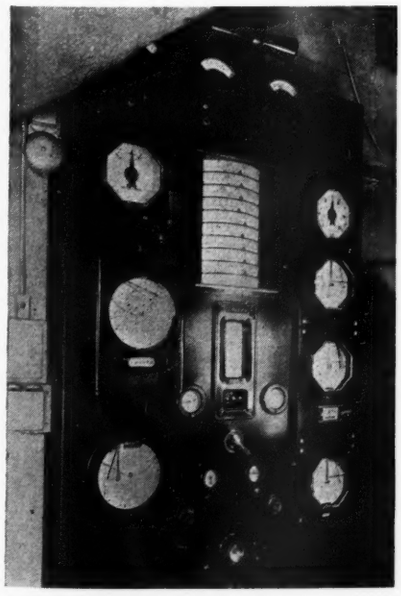
Instrument panel for automatic combustion-control system. On this panel are mounted the master controller, with its transfer lever for changing from automatic to manual operation. There is a nine-unit multipoint indicator showing steam and feedwater pressures and draft at various points in the boiler and combustion equipment. And there are also recorders for the flows of natural gas, steam, percentage of CO_2 and various steam, gas and water temperatures.



Diagrammatic layout of Smoot automatic combustion control system in Worcester salt plant. The system includes a master controller and oil-operated regulators on the boiler fuel feeds and draft fans. Not only is the rate of steam generation controlled to meet demands, but ratio of fuel and air is regulated to give high efficiency.

on the Reeves drive. This lever is operated, in accordance with master controller impulses, by a regulator in which the feeder speed, as measured by a speed element, is balanced against the master loading on the weigh-beam. Three pulverizers are connected to two burners in such a way that various combinations of pulverizers can be used. The pulverizers are started or shut down by hand, of course.

Flow of air and flue gas through the boiler is controlled by varying the speed of the induced-draft fan.



This is done by a master-loaded regulator which operates a regulating valve in the steam supply line of the turbine driving the induced-draft fan, thus varying its speed. To maintain constant pressure in the furnace, a regulator, spring-loaded instead of master-loaded, varies the supply of combustion air from the forced-draft fan by operating a valve in the turbine steam supply line to vary the turbine speed. Although this regulator is not master-loaded it must be synchronized with the control system, for any change in combustion conditions will affect it.

By a simple transfer valve, operated quickly and easily by hand, the control of the master-loading air pressure can be changed from the automatic to manual in which a hand-operated air-pressure controller varies the master loading. This transfer from automatic to manual control is made without affecting in any way the operation of the combustion equipment. Master-loading pressures to fuel-feed and air-flow regulators are indicated by manometers on the master controller. Ratio adjusters permit these loading pressures to be varied and adjusted with respect to each other so that the ratio of fuel and air to give best combustion can be established. The master controller will then maintain this fuel-air ratio over the load range. If the fuel supply varies or other conditions change, the ratio can be easily adjusted to suit.

▶Automatic controls have long ago been proven practical tools with which to improve efficiency, cut costs and better quality. The automatic controls described in this article are typical of food-factory power-generation applications. And the same type of controllers can be used in processing to regulate pressure, flow and liquid level. They are of value to

All Food Manufacturers

To secure good operating procedure, a completely equipped Republic boiler control panel is installed which shows the operator the status of all factors in boiler operation whether the unit is an automatic or manual control. On this panel are mounted the master controller of the combustion control system with its transfer lever for changing from automatic to manual operation; also a nine-unit multi-point indicator showing steam and feed-water pressures and draft at various points in the boiler and combustion equipment. A number of recorders are also mounted on the panel for recording flows of steam and natural gas, percentage of CO_2 and various steam, gas and water temperatures.

PRESERVING
Grapes and Grape Juice

By C. H. S. TUPHOLME
Farnham, England

WHEN PRESERVING GRAPES and fresh unfermented grape juice, it is particularly important to keep the temperature and degree of humidity constant. In this connection some interesting experiments were undertaken by the Compagnie de Construction Mecanique Procedes Sulzer, Paris, at the request of the Societe Meridionale de Transport de Force and the Distillerie Cooperative de Nissan, Herault.

The experimental plant was of a size which could be used in practice, since with it 50 tons of grapes could be handled. The refrigerating equipment comprised a vertical ammonia compressor with a normal refrigerating capacity of 220,000 B.t.u. per hour, a trickling condenser, a brine cooler with evaporating coils, and an air cooler of smooth tubes cooled by the brine. The degree of humidity in the cold room could be regulated by changing the mean brine temperature of the air cooler.

The method adopted was as follows: The grapes were sent in baskets to the preserving plant, where they were examined and all grapes were removed which were defective in any way, either by mold or through insects. The perfect grapes were packed with paper between them in baskets containing 15 to 18 lb. each. They were then placed for a few minutes under a slight vacuum in an autoclave or pressure-tight vessel into which a sterilizing solution had been sprayed. The fruit was then brought into a cold room in which the air was kept at a temperature of 32 deg. F. and the humidity as high as possible. The high degree of humidity was intended to prevent evaporation from the grapes and consequent shrinking. It might be though that such a degree of humidity would cause the grapes to become very moldy; however, the thorough examination of the grapes and the sterilizing to which they were subjected prevented the formation of mold. The baskets were stacked in easily accessible piles and were not touched while they were in storage, except from time to time when samples were taken.

The method has given highly satisfactory results, in spite of the fact that the staff in charge of the plant had had no previous experience in handling grapes. During the tests it was possible to determine what kind of grapes were best suited for preserving, and the approximate cost of treating them. The tests showed that late ripening types of grape picked at the beginning of October could be preserved very well to the end of March without any visible deterioration in quality. It was also found that, although the outer surface of the grapes remained smooth, the inside lost moisture to a large extent, thus giving the juice a higher content of sugar and salts.

The following table shows the results of an analysis of two samples of juice obtained from grapes which had been put in storage in October and pressed in the following year in February and March respectively. The analysis showed that the juice pressed out in March was sweeter and more tasty than that obtained a month earlier.

		February	March
Dry extract, 100 deg.	grams	206.2	226.2
Ash	"	2.0	3.06
Reduced sugar	"	200.0	221.2
Alcohol (in the form of sugar)	degrees	12.5	13.8
Acid, total	"	3.18	3.08
Acid, combined	"	2.91	2.96
Acid, volatile	"	0.27	0.12

The first results were not satisfactory, in that all possible varieties of grape were stored without any attention being paid to their condition. The grapes had been picked in all sorts of weather and also by people who were only accustomed to pick grapes for immediate pressing. Through better training of the grape pickers and the employees in the cold storage warehouse, and improvements in the packing of the grapes, the losses have been practically eliminated, and grapes of faultless appearance and good flavor can be put on the market until April.

Experience has also been gained in recent years on preserving grape juice in a natural unfermented state. It is now possible to store grape juice for several months without deterioration in suitable closed vessels, either at a low temperature and normal atmospheric pressure, or at normal cellar temperature and under pressure from carbon dioxide. The latter method is the one most generally used commercially. The juice is treated as follows:

After the fruit has been pressed (the same method applies also to juice extracted from apples and pears), the juice is collected in settling tanks from which it passes through a sterilizing filter into the pump, where carbon dioxide is added to the juice and both are pumped together into the storage tanks. In most installations the tanks themselves are charged with carbon dioxide under moderate pressure before being filled with the grape juice. When a tank is full of juice, the pressure should have reached about 100 to 115 lb. per sq.in. In time, however, this pressure falls because of the gradual reduction in the volume of the juice and the fall of temperature in the cellar, so that a certain amount of carbon dioxide must be added to the tanks for two to four months until the pressure remains constant. It is also possible to introduce the carbon dioxide directly into the filled tank from below, instead of through the pumps, since the fruit juice can be impregnated directly with carbon dioxide within certain limits, particularly in small tanks.

The storage tanks must be suitable and carefully designed and constructed for perfect preservation of the fruit juice. The tanks employed are generally of welded construction. Internally, the tanks are lined with a neutral protecting medium, which must be of such a character that it does not affect either the taste or the natural color of the fruit juice. Certain compositions of resin of different kinds prove suitable for this purpose, complying closely with the above-mentioned requirements. In several cases enclosed containers of stainless steel have been used, their advantage being that there is no expense for maintenance of any inner lining, although initially they cost more than lined tanks.

Other methods of storing grape juice have recently been tried. For instance, the juice has been kept in refrigerated cellars, under carbon dioxide at a lower pressure.

DESIGNING MACHINES

To The Doctor's Prescription

Milk plant equipment, which must be thoroughly cleaned daily, requires special design features. With the extension of rigid sanitary requirements to other food industries, the designer's experience on milk equipment becomes widely useful.

By G. C. Hagblom
New York, N. Y.

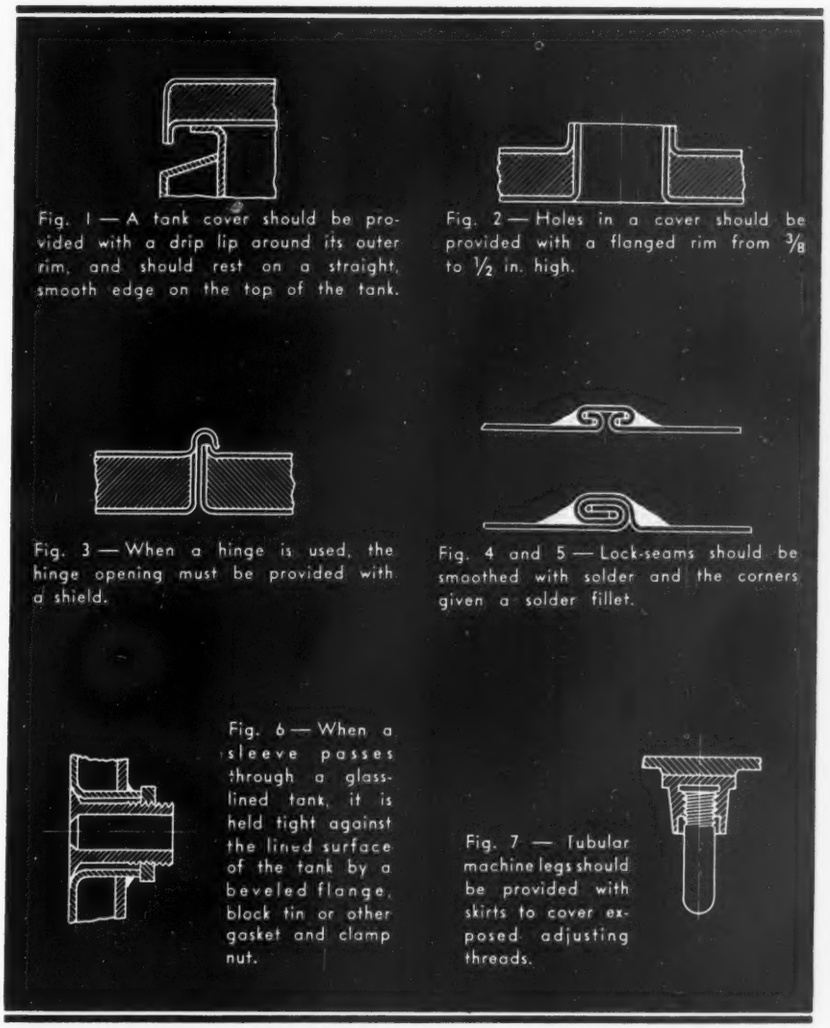


Fig. 1 — A tank cover should be provided with a drip lip around its outer rim, and should rest on a straight, smooth edge on the top of the tank.

Fig. 2 — Holes in a cover should be provided with a flanged rim from 3/8 to 1/2 in. high.

Fig. 3 — When a hinge is used, the hinge opening must be provided with a shield.

Fig. 4 and 5 — Lock-seams should be smoothed with solder and the corners given a solder fillet.

Fig. 6 — When a sleeve passes through a glass-lined tank, it is held tight against the lined surface of the tank by a beveled flange, block tin or other gasket and clamp nut.

Fig. 7 — Tubular machine legs should be provided with skirts to cover exposed adjusting threads.

WHEN designing machines for the food industries, the machine designer has a different problem than when designing the regular run of production equipment. It becomes necessary for him to study the various local food and health regulations and so design the food equipment that it will comply with these rulings.

With most machinery, the designer must incorporate strength, appearance, and capability to perform the work for which it is intended. If the machine fulfills these requirements, nothing else is expected.

Not so, however, with equipment for the milk plants and other food processing establishments. Here there must be continuous thought for cleanliness and sanitation. Easy handling when dismantling for daily washing and sterilization of parts coming into contact with milk, cream or other food ingredients, is a prime consideration.

The material from which the machine or part is to be fabricated will give the designer his starting point. Consider, for example, the door casting on a return bend of a tubular regenerator, or a similar part where the product comes into contact with a surface of irregular shape. This surface must be smooth, and therefore must be machined by one method or another.

It is first necessary to determine the cost of die equipment necessary to produce the part. If the number of parts needed is too small to warrant the expenditure for dies, recourse can be had to welded construction. At times, a combination of stamped parts may be welded together into one assembly, and the whole produced for less cost than for a single stamping, again considering the equipment necessary to produce the desired part.

The next point for the designer to consider, after the material and the method of fabrication are determined, is the matter of easy cleaning. This is paramount in the design of good equipment and the designer must keep it constantly in mind. The machine must be so designed that the plant operators can easily reach and clean every square inch of its interior surface. This requirement generally narrows down to one thing that is always in the mind of the experienced designer, the avoidance of all sharp corners on internal surfaces, with the provision of large, generous fillets or rounded surfaces in the corners. The larger the radius of such a fillet, the better. If the designer has the word "radius" constantly in his mind, it will evidence itself in improved design.

Consider next the cover used on a pasteurizer, vat or processing vessel. Here the necessity is to take every precaution to prevent foreign material, liquid or solid, from getting into the product that is being processed. This, of course, calls for a straight.

(Turn to page 415)

Fig. 1. To get rapid cooling of heavy beef rounds, the cooling needle is inserted into carcass from the inside to make contact with the hip joint where souring is most likely to start.

LOCALIZED COOLING

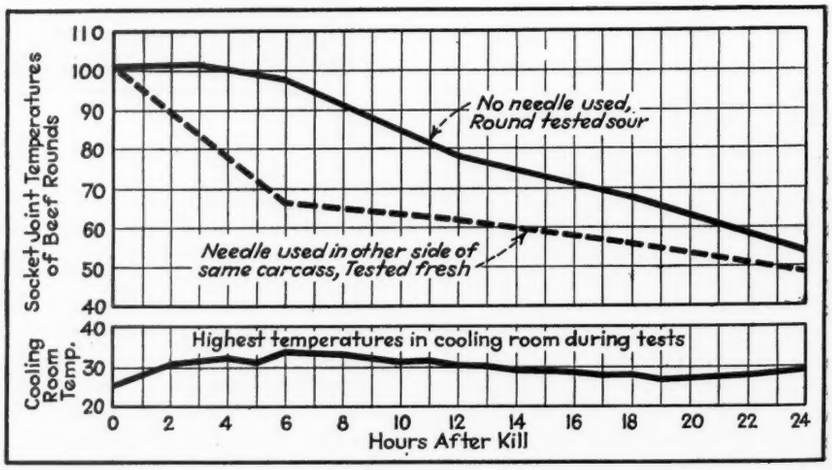
Stops Meat Losses and Lowers Refrigerating Costs

Application of cooling temperatures at point of likely decomposition in heavy beef rounds shortens cooling time and makes freezing temperatures unnecessary in cooler rooms.

SAVINGS IN REFRIGERATION COSTS and in heavy beef losses are the returns to Wilson & Co., Chicago, Ill., on investment made in getting refrigeration to the spot where it is truly effective for the preservation of a highly perishable food.

In this particular case the food is heavy beef meat. It might be any other food material in which the possibility of bacterial decomposition is normally present and in which the rate of heat transfer is relatively slow because of the mass of the object being cooled or because of the insulating effect of its exterior surface or wrappings.

The means by which Wilson & Co. has obtained such encouraging results with its heavy beef rounds is a hollow stainless steel needle through which flows a regulatable stream of cold brine. The needle itself has a length of 17½ in. from base to tip, an outside diameter of 7/16 in. and a solid sharp point which permits insertion into the beef hind quarter to make direct contact with the hip joint region where bacterial decomposition is most likely to start if the temperature in this region is not brought down to 50 deg. F. or lower in twelve hours or less after the animal is killed.



Under same brine and cooler temperatures beef rounds on heavy carcasses of similar weight show a 16 to 31 degrees lower temperature between six to twelve hours after kill when cooled with refrigerated needle than when needle is not used. Brine, 19 deg. F., flows through needle at rate of 30 gal. per hour and comes out of needle 6 deg. F. higher temperature, (25 deg. F.) than when going in.

Full and uniform circulation of the brine through the needle is assured by an inner tube assembly. This inner tube is also of stainless steel construction, has a diameter of ¼ in. and fits into the base and body of the needle to direct the flow of the incoming brine to the point section of the needle. From the point the brine flows back between the walls of the needle and

inner tube to an outlet in the needle base. These inlet and outlet connections of the needle are joined with the over head brine line by flexible hose lines which keep the installation costs low and permit considerable freedom of motion in the insertion and withdrawal of the needle.

When not in use the needles may be hung from hooks on the wall behind the overhead trolley passage-way or suspended from the overhead brine line. At no time do they interfere with the flow of brine through the lines or the passage of carcasses on the trolleys. Petcocks permit stoppage of brine flow through needles when not wanted.

U.S. Patent No. 1,780,267, covering this needle refrigerating device was granted eight years ago to John P. Malone, beef division superintendent and Adam Young, beef killing foreman of Wilson & Co., but not until a year ago did the needle become commercially feasible through refinements in design and laboratory studies of results obtainable through its use.

"Sour rounds" have long been a packing house problem which generally makes itself known in connection with the best grades of beef: hind quarters from animals finished off on rich foods and dressing out at 700 lb. or heavier. The trouble-causing bacteria are likely to be present in the flesh of the living animal but are ineffective as long as the meat tissues are in a living state. Unless the temperature of the carcass is cooled relatively quickly these micro-organisms begin to increase rapidly in numbers and in their attack upon the meat tissues.

Beef from heavy cattle cools slowly because of the large bulk as well as because of the character of the meat and the insulating effect of the thick layer of external fat. The hind quarters are the heaviest portions of the carcasses hence the slowest to cool and the most susceptible to bacterial decomposition or "souring."

Under ordinary conditions, as long as 24 hours may be necessary to cool heavy beef rounds to the safe temperature of 50-55 deg. F. even with the cooler room held at 23 deg. F. Since "souring" is likely to take place in twelve to fifteen hours under such conditions, the dependence upon low cooler temperatures has its possibility of heavy meat loss as well as its heavy refrigeration cost.

Maintenance of a 23-25 deg. F. cooler temperature previously required a brine temperature of 15 deg. F. which in terms of power cost means an unnecessary expense over that now required. With the use of these needles, the cooler room temperature is held at about 32 deg. F. with a brine temperature of 18 to 22 deg. F. These cooler and brine temperatures are also sufficiently low to chill properly the light weight carcasses not needing the needles.

The difference of the effect of these cooler and brine temperatures upon the cooling of carcasses with and without the needles may be seen in the following table for a 1,066-lb. dressed carcass.

Cooling Beef Rounds With and Without Refrigerated Needle

	With Needle Deg. F.	Without Needle Deg. F.
Temperature of round into cooler.....	107	107
Temperature of round 6 hr. after kill...	66	98
Temperature of round 12 hr. after kill..	62	79
Temperature of round 18 hr. after kill..	55	68
Temperature of round 24 hr. after kill..	49	59

This rate of cooling data holds even in the case of carcasses weighing considerably less than 1,000 lb.

Discoloration or tearing of the meat through the insertion of these needles is averted by the stainless steel composition, by the size and shape of the needles, and by the manner in which they are inserted from the inner side of the carcass alongside the upper end of the thigh bone.

Chilled in this manner, heavy beef carcasses, if necessary, may be put through the chilling room in considerably less time than formerly. That means an increase in production capacity of an existing chilling room. Viewed from another angle the size of a chilling room required to handle an estimated number of heavy beeves over a given production period may be reduced if the refrigerated needle method of chilling is used.

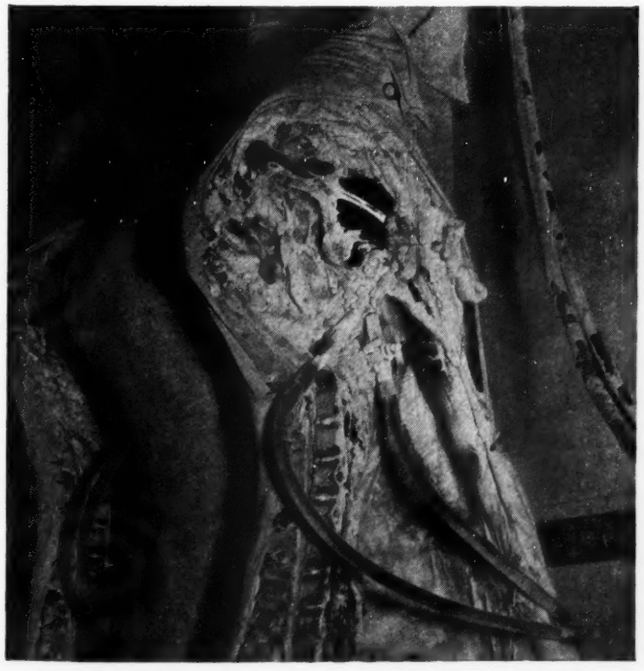


Fig. 2. Cooling action of the brine flowing through needle is indicated by formation of frost on the hose and valve connections leading to the needle imbedded in the beef round.

Fig. 3. During the cooling period the carcasses hang from the trolleys in the cooling room in the same relative manner as though cooling needles were not used. Shortened cooling time not only prevents spoilage of meat, it makes possible savings in refrigerating costs and increased cooling capacity of rooms.

What It COSTS to Build

Figures of Detroit Real Estate Board Give Reasonable Basis for Estimates

ECONOMIC CONDITIONS, over the past eight years, have been such that American industry has done comparatively little in the way of building new plants or enlarging existing plants. Because of this fact, it is certain that much new building needs to be done, and will be done as soon as the level of business activity warrants. And that may be within the next year, according to many economic authorities. Consequently, many food plant executives may wish to estimate the possible cost of any expansion that might prove necessary.

In the tabulation given herewith are figures for the cost in cents per cubic foot of various types of buildings used for manufacturing purposes by food and other industries. While these figures only hold true for the Detroit area, they are sufficiently typical to be a useful guide to manufacturers who contemplate building in various other regions.

In using this schedule, the rules established by Commissioner Joseph P. Wolff of the Detroit Department of Buildings and Safety Engineering, and his department heads, should be observed. These rules follow:

"The cubical volume of a building for the purposes of determining the fees shall be measured as follows:

"From the outside of the walls and from the basement floor to the mean point of a pitched roof or to the highest point of a flat roof. The volume shall include all dormers, enclosed porches, pent houses, and other enclosed portions of a building, but shall exclude open porches.

"In the case of buildings without basements, the measurements shall be taken from the ground line, and in the case of large buildings having deep foundations, the height shall be measured from a point below the basement floor by an amount equal to 1/5 of the depth of the foundation.

"In the case of open shelter sheds and other open sheds, the volume shall be determined by measuring from the projection of the edge of the roof and from the ground line to the mean height of the roof."

The cost figures presented are presumed to represent the minimum cost at which a fairly good building of economic design, may be constructed under most favorable circumstances within the Detroit district. The costs contain architects' fees and contractors' profits and include all general items of construction and equipment, including plumbing and heating systems, elevators, etc. The schedule does not include costs of special equipment, such as incinerators, refrigeration, compressed air piping, etc., and does not include the cost of financing.

As bids of individual contractors may vary from 20 to 50 per cent, so may there be a marked variance in the costs of similar buildings erected within a single area. The quality of construction must be taken into account. The schedule presented is based upon the cost of average construction. The costs might be lessened by inferior construction or substantially increased by superior construction. In all instances the schedule should be used to reinforce rather than to supplant the experience, information and judgment of the user.

Since 1915, the schedule has been prepared under like circumstances and based upon like factors. It may be assumed, therefore, to present a rather accurate picture of the movement of building costs in the Detroit area during the past 23 years.

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Cost of Buildings Per Cubic Foot in Cents*

Classification of Buildings	Aug, 1920	Jan, 1, 1921	Dec, 1, 1922	Jan, 1, 1924	Feb, 1, 1925	Feb, 1, 1926	Feb, 1, 1927	Jan, 1, 1928	Jan, 1, 1929	Jan, 1, 1930	Jan, 1, 1931	Jan, 1, 1932	Jan, 1, 1933	Jan, 1, 1934	Jan, 1, 1935	Jan, 1, 1936	Jan, 1, 1937	Jan 1, 1938
Factories and Warehouses:																		
Fireproof (Under 300,000 cu.ft.)	.31½	.23	.21	.24	.23	.22½	.23	.22	.22	.22	.16½	.15	.14	.16	.16½	.19	.21½	.25
Fireproof (Over 300,000 cu.ft.)	.29	.21	.19½	.23	.22	.21½	.22	.21	.21	.21	.16	.14½	.12½	.14	.15	.17	.20	.21
Mill construction	.22½	.15½	.14	.16½	.16	.16	.16½	.15¾	.15¾	.15½	.11½	.11	.10	.11½	.12	.14	.16	.17
Ordinary	.21	.15	.13½	.15	.14½	.14	.14½	.14	.14	.13½	.10	.09½	.08½	.09½	.10	.11½	.13	.14
Frame	.17	.12	.11½	.13	.11	.10½	.10½	.10	.10	.10	.07½	.07	.07	.08	.08½	.10	.11	.10
Stores:																		
Fireproof	.51	.39	.36	.41½	.40	.39	.39½	.38	.38	.38½	.30	.29½	.26	.30	.31	.35½	.39	.42
Ordinary	.37½	.26½	.24½	.28	.26½	.26	.26½	.25½	.25½	.25	.20	.19	.16½	.20	.21	.24	.26½	.22
Flats (Above Ordinary)	.48½	.34	.30½	.31	.29	.28	.28½	.27½	.27½	.27	.22	.21	.18½	.21	.22	.25	.28	.25½
Ordinary without Basements	....	....	.18½	.21	.19	.18	.18	.17½	.17½	.17	.14¼	.14	.12	.14	.15	.17	.19	.16
Office Buildings:																		
Fireproof	.68½	.54½	.51	.54½	.52	.51	.51½	.49¾	.49¾	.50	.39	.37½	.32½	.37½	.39	.44½	.50	.55
Ordinary	.48½	.34	.30½	.35	.33½	.32¾	.33¼	.32	.32	.32	.25	.24	.21½	.25	.26½	.30	.33½	.36
All Steel Buildings:																		
Under 20,000 cu.ft	.25	.21	.19½	.20	.14	.13½	.13½	.13	.13	.13	.11	.11	.10	.11½	.12	.14	.16	.17
20,000 to 100,000 cu.ft	.18	.15	.14	.14½	.12	.11	.11	.10½	.10½	.10½	.10	.10	.09	.10	.10½	.12	.13	.14
Over 100,000 cu.ft	.14	.13	.11½	.11½	.10	.09½	.09½	.09	.09	.09	.07	.07	.06½	.07	.07½	.08½	.09½	.10
Garages:																		
Fireproof	.30	.23	.21	.24	.23	.22½	.23	.22¼	.22¼	.23	.17	.17	.15½	.17½	.18	.21	.23½	.25
Mill Construction	.20	.15	.14	.16	.15	.14	.14½	.14	.14	.13½	.11	.11	.10	.11½	.12	.14	.16	.17½
Ordinary	.17	.14	.13	.15	.13½	.12½	.13	.13	.13	.13	.10	.10	.09	.10	.10½	.12	.13	.14
Frame	.14	.12	.10½	.12	.10	.09½	.09½	.09	.09	.09	.08	.07	.06½	.07½	.08	.09	.10	.11
Sheds Without Heat:																		
Enclosed Without Floor (Frame)											.04¾	.04½	.04	.04½	.05	.05½	.06	.05½
Enclosed (Frame)											.06	.06	.05	.06	.06½	.07	.08	.08
Enclosed (Ordinary Construction)											.09½	.09¼	.09	.09½	.10½	.12	.13	.14
Enclosed Without Floor (Ordinary Construction)											.09¼	.09	.08	.09½	.10	.11½	.12½	.13
Enclosed (All Steel)											.04½	.04½	.04	.04½	.05	.05½	.06	.07
Enclosed Without Floor (All Steel)											.03½	.03½	.03¼	.04	.04	.04½	.05	.06
Open Shelter (Frame Construction)											.03	.03	.03	.03	.03½	.04	.05	.04½

Blanching Vegetables for FREEZING PRESERVATION

PART I

*Effect of Blanching on Quality Control**

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BLANCHING OR SCALDING prior to packing, followed by rapid cooling of vegetables is now well established as an essential practice in the preparation of vegetables for preservation by freezing. With but few exceptions, all vegetables are now scalded, in boiling water or in steam, then cooled in running cold water before freezing. It is recognized by all investigators in this field that scalding is necessary to inactivate certain enzymes which would otherwise bring about deleterious changes in aroma and flavor, scalding also tends to brighten the color of the vegetable and minimize the changes in color on subsequent cooking.

In addition to inactivating certain enzymes, scalding is used to aid in the removal of undesirable matter, and to prepare the vegetable for packaging by forcing out air, and also causing a loss of turgidity. This is also the practice in preparing vegetables for canning. The scalding of vegetables for freezing differs, however, in several essentials from scalding for canning. Prompt cooling or chilling of the vegetables to be frozen is an essential practice in freezing, whereas in canning practice this is not desirable, particularly in leafy vegetables such as spinach. Here, any heat loss is avoided as much as possible for the sake of subsequent heat processing. Furthermore, the period of scalding is somewhat shorter for some vegetables and considerably longer for others, as will be evident in comparing the figures given in Table I with those in Table II.

Though all investigators agree that scalding is desirable in the preparation of vegetables for freezing, there is some difference of opinion concerning the most suitable scalding temperatures and periods of exposure to be employed in producing frozen vegetables of high quality. These differences of opinion may be due to variations in the vegetables used (such as variety, maturity, freshness or growing conditions), to the methods of the investigation, or to the different objectives of the respective investigators.

In the early investigations in this field, more attention was paid to the destruction by heat of the enzymes concerned in the deterioration than in the possible effect of such treatment on the quality of the vegetables. This is characteristic of all the early developments in the processes of food preservation. Thus, in canning, at first all the effort was directed to making the foods keep, whereas the present trend is toward the retention of the original natural qualities, i.e., maximum preservation with minimum of effect on the composition, flavor and nutritive value (See A. W. Bitting, 1938). Preservation freezing differs from other methods of food preservation, in being capable of producing the least alteration in the original quality of the product to be preserved. This effect should be properly safeguarded.

The earlier investigators recommended considerably longer periods of scalding than are now being used, either because of their anxiety completely to inhibit all enzymic activity in the vegetable, or for some other objective. In the early investigations of the Fruit Products Laboratory (Joslyn and Cruess, 1929), we were guided in our choice of blanching conditions by the current practice in canning since, at that time, there was not available to us any study of the enzyme activity applicable to freezing practice. There was no evidence as to the nature of the systems involved in the deterioration of frozen vegetables.

In 1932, extensive blanching tests were made on locally grown garden peas, string beans, and spinach. These were blanched in small lots at various temperatures for two minutes, then cooled, placed in containers and frozen at 0 deg. F. Also juice from the same vegetables were prepared for enzyme studies, and this was also frozen. At periodic intervals, samples were removed from storage, allowed to thaw, and then observed, both in the raw state and after cooking.

Steam blanching asparagus prior to freezing

The results obtained from the foregoing investigations indicate quite definitely that over-blanching produces changes in texture and flavor that may be as objectionable as under-blanching; but the changes are of a different type. At a definite period of scalding there is a critical temperature range below which the formation of off-flavors is not entirely inhibited, and the color is not "set." And above this temperature range there is a loss of fresh flavor, formation of cooked flavors, and softening of texture. This temperature range is apparently different for each vegetable and increases with the storage period.

So definite were the changes that we observed, that we reported in 1933 (Joslyn and Marsh, 1933), our observations made on samples stored at 0 deg. F. for four months, stating that this range is between 160 and 170 deg. F. for peas, between 180 and 195 deg. F. for string beans, and between 160 and 180 deg. F. for spinach. On longer storage, the minimum temperature was found to be higher, particularly for peas.

During the summer of 1932, observations were made on the enzyme activity of vegetables used in blanch-

* Based on a paper presented at the California Frozen Pack Conference, San Francisco, April 12, 1938.

Table I—Blanching Periods Used in Preparing Vegetables for Canning

Authority	Artichokes	Asparagus	String bean	Lima bean	Cauliflower	Corn on Cob	Peas	Spinach	Broccoli	Brussels Sprouts
Anon. (1)	10 min. in citric acid solution	3 min. in boiling water	1½–3 min. at 190° for very small size to 4 min. for larger and as long as 8 min. for tough	2½–3 min. at 190–200° F. for young tender beans 7–8 min. for older and dried beans	3–4 min. in citric acid sol. (1 oz per gal)	10–15 min. in boiling water	1½–2 min. at 209° F. for small sizes; those for larger	3 min. at 212° F. or longer time at 160–170° F.	3–4 min. in boiling water containing citric acid	3–5 minutes
A. W. Bitting (2)	10–20 min. in boiling acidified brine	2–5 min. in boiling water until the stalks are pliable and will not break	2 min. for smaller sizes; 3–4 for larger 5–6 for old. Almost universal practice	Short blanch like peas	3–4 min. in citric acid solution (1 oz per gal)	10 minutes	1½–2 min. at 200° F.; 3–4 min. for larger sizes	1½–6 min. in water at 185–210 160° F.	.....	.....
Campbell (3)	.....	3 min. in boiling salt brine	5 min. in boiling water	4–6 min. in boiling water	3 min. in boiling water	5–10 min. in boiling water	2–3 min. for small peas	3–5 mun. in boiling water or a longer time at 160°	.....	.....
Chenoweth (4)	.....	6–8 minutes	3–5 minutes	.....	3–5 minutes	5–8 minutes	3–8 minutes	.....	.....	.....
Cruess (5)	.....	3–4 min. in boiling water	3–10 min. in boiling water	As for peas	.....	.....	½–30 min. in boiling water	6 min. at 185–212° F.	.....	.....
Cruess (6)	5 min. in water acidified with ¾ cup vinegar per gal.	3–6 minutes	2–10 minutes	.....	5 minutes	.....	2–4 minutes	.....	.....	.....

(1). Anon. A complete course in canning. The Canning Trade. Baltimore. (1936).
(2). A. W. Bitting. Appertizing or the Art of Canning. The Trade Pressroom. San Francisco. (1927).
(3). Clyde H. Campbell. Campbell's Book. Vance Publishing Company. New York. (1937).
(4). W. W. Chenoweth. Food Preservation. John Wiley & Sons, Inc. New York. (1930).
(5). W. V. Cruess. Commercial Fruit and Vegetable Products. McGraw-Hill Book Company, New York. (1924).
(6). W. V. Cruess and A. W. Christie. Home Canning. Calif. Agr. Expt. Sta. Circ. 276. (1924). Revised by W. V. Cruess. (1935).

ing. It was found that these vegetables gave a strong test for peroxidase (bluing benzidine in presence of hydrogen peroxide) and for catalase (evolution of oxygen from hydrogen peroxide); also that, in general, the inactivation temperature for the peroxidase in the vegetable juice was somewhat higher than that found for the enzymes involved in producing off-flavors. This is not surprising in view of the strong heat resistance of peroxidase. Our observations were complicated by the well-known "regeneration" of peroxidases after inactivation by heat (see Hand, 1933). Little attention was given by us to catalase, in these preliminary investigations, beyond noting that it was inactivated at lower temperatures than peroxidase in most cases.

During the following year, 1933, our blanching tests were extended to include the effect of time of blanching, temperature, composition of the mediums, and other factors. The samples of asparagus, peas, spinach and string beans that were then packed are still under observation. They were used in our studies of enzyme activity, the first report of which was made by Arighi *et al* in 1936.

Diehl, Dingle and Berry reported in 1933 that heat penetration into Alderman peas was quite closely related to catalase inactivation, and that the rate of heat penetration could be inferred by changes in the color of peas. Also they found that peas scalded at various temperautres for periods long enough to inactivate catalase did not develop the undesirable odor, nor did they change in color when stored at 20 deg. F. for four months. To inhibit catalase activity in No. 3 sieve size Alderman peas, they found the time-temperature requirements to be as follows: 30 seconds at 210 deg. F.; 50 seconds at 190 deg. F.; 105 seconds at 160 deg. F. Kertesz (1933) reported similar figures for inactivating the respiration of canning peas: 30 seconds at 212 deg. F.; 60 seconds at 194 deg. F.; and 330 seconds at 176 deg. F. However, Arighi *et al* (1936) reported that the catalase of the Telephone variety of peas used in our own tests was inactivated after fifteen seconds at 212 deg. F.; after two minutes at 149 deg. F., and required more than twenty minutes at 131 deg. F. when determined quantitatively. These periods were considerably lower than those necessary for the retention of flavor and color over a prolonged period of storage.

The peas prepared in the 1933 tests were blanched for two minutes in water at the following temperatures: 68, 104, 122, 140, 154, 158, 163, 167, 171, 176, 185, 194, 203, and 212 deg. F., respectively. Additional lots were blanched in water for various lengths of time from 30 seconds to 60 minutes at 131, 149, and 167 deg. F.; and in boiling water and in flowing steam for 15 and 30 seconds, also one, two and five minutes, respectively.

The first examination of the peas occurred after storage at 0 deg. F. for four months. Samples were thawed at room temperature and examined. In the series blanched for two minutes at various temperatures, the setting of the color began at 158 deg. and was fixed at 167 deg. F. In the samples blanched at 194, 203 and 212 deg. F., the skin was tough and the cotyledons were soft and mushy, the mushiness increasing with temperature. The texture of samples of 20-deg. to 185-deg. F. was about the same, with softening progressing as the temperature increased. Flavor of the 194, 203 and 212-deg. F. samples was fair, but somewhat "cooked." Samples blanched at 185, 176, 171 and 167 deg. F. were of good fresh flavor, with samples at 171 deg. being the best. Fair, with but slight off-flavor, was the comment on 163-deg. and 158-deg. blanching, but the 154-deg. test was definitely off flavor and samples blanched at lower femperatures were unpalatable. These peas were then boiled for ten minutes in a 2-per cent brine and examined. The color of the peas blanched at temperatures below 171 deg. F. was a drab olive; greening began at 171 deg. F. and was at a maximum at 212 deg. F.

A marked difference in flavor occurred between the unblanched (68-deg.) and the 104-deg. sample. The latter was much more offensive in odor and unpalatable. The best flavor was observed in the samples blanched at 176 to 185 deg. F., a slight off-flavor (hay-like) being apparent at 171 deg. F. The cooked flavor was noticeable at 194 deg. F. Peas blanched at 194 to 212 deg. F. were almost devoid of pea flavor. At 212 deg. F., they were bright green in color, plump, and of best appearance, but flat in taste, with the texture of small sacks of mush.

The peas blanched at 131 deg. F. were all olive green in color, and all had an objectionable putrefactive odor,

which was more noticeable in the unblanched sample. Flavor of the peas blanched for one hour was flat, while those blanched for twenty minutes were fair in texture and flavor. On boiling, the 60-minute sample was found lacking in flavor and too soft in texture. Only the twenty-minute sample had any fresh flavor. Those blanched for sixteen minutes or less were unpalatable. Similar observations were made on the samples blanched at 149 deg. and 167 deg. F.

Another examination was made after storage for two years. Samples of a canned frozen material were removed from freezer storage, allowed to thaw for several hours, opened, boiled in a 2 per cent sodium chloride solution for ten minutes and then observed for color, odor, texture and flavor, both before and after cooking. In the samples of peas blanched for a constant time of two minutes, decided color changes occurred in the sample blanched at 158 deg. F. Samples blanched below this temperaure were a dull olive green color, while those blanched at higher temperatures were the bright, grassy green characteristic of properly blanched peas. On cooking, the 158 and 167 deg. samples turned to olive green, whereas the samples blanched at 172 deg. F. and above, retained the green color. Texture changes occurred in the sample blanched at 194 deg. F. Samples blanched below this temperature were of crisp texture and remained so on cooking. The 194, 203 and 212 deg. samples had tough skin and the cotyledons were of mushy texture, mushiness increasing with the temperature. The skins separated from the cotyledons on cooking.

Noticeable differences in flavor and odor occurred in the ranges of temperatures from 68 to 171 deg., from 176 to 185 deg. and from 194 to 212 deg. F. Both before and after cooking the odor and flavor of the samples blanched in a temperature range between 68 and 171 deg. F. were decidedly hay-like and disagreeable. This was more pronounced in the sample blanched at 40 deg. F. than in the unblanched sample at 68 deg. F. The objectionable qualities increased in intensity as the temperature of blanching increased. Samples blanched at 176 deg. F. and 185 deg. F. had a clean, fresh, pea odor and flavor, comparable in all respects to those of the fresh product. In the cooked samples, blanched at 194, 203 and 212 deg. F., it was possible to detect an off-odor and off-flavor not usually associated with cooked peas. These effects increased as the temperature increased.

Samples of peas blanched for various periods of time at 131, 149 and 167 deg. F., were all found undesirable in color, odor and flavor. Samples blanched for periods longer than ten minutes at those temperatures were also decidedly mushy in texture on cooking.

Samples of spinach blanched at various temperatures for a constant time were similar in behavior to peas with respect to the effect of temperature of blanching on color, odor and flavor, but to a less marked degree and over a broader temperature range. Samples blanched between 68 deg. and 185 deg. F. were of poor color, odor and flavor. Those blanched over 188 deg. F. were satisfactory in color and flavor.

Part II will appear in the August issue of "Food Industries." It will cover the inactivation of the enzymes in vegetables.

Table II—Blanching Periods Used in Preparing Vegetables for Freezing

Authority	Asparagus	Green and Wax Beans	Lima Beans	Broccoli	Cauliflower	Peas	Spinach	Kale	Sweetcorn	Mushroom
Joslyn and Cruess (1929)	2–5 min. in boiling water	2–5 min. in steam	.....	.....	.....	2–5 min. in boiling water or steam	2–5 min. in steam or boiling water	.....	2–5 min. in steam	.....
Joslyn and Marsh (1933)	1 min. in steam	1 min. in steam for cut beans	.....	.....	.....	1 min. in steam	.....	.....	.....	.....
Diehl et al (1934)	2–3 min. in boiling water	2–4 min. in boiling water, or flowing steam	.....	3–5 min. in boiling water or flowing steam	2½–3½ min. in boiling water	½–1½ min. in boiling water	2–3 min. in steam or boiling water	.....	6 min. in boiling water; 8 in steam with husks; 3–4 min. in water or 6 min. in steam	2 min. small. 3–4 min. large
Arighi, et al (1936)	.....	.....	.....	.....	.....	2 min. at 176–194° F.	.....	.....	.....	.....
H. H. Moon et al (1936)	.....	2–4 min. in boiling water (about 203° F.)	2–4 min. in boiling water	.....	.....	1–3 min. in boiling water (206° F.) depending on size and maturity	.....	.....	4 min. in boiling water (average temperature 206° F.)	.....
Smart and Brunstetter (1936)	.....	.....	3 min. in boiling water	.....	.....	.....	3 min. in steam	5 minutes	.....	.....
Wiegand (1936)	2–3 min. in boiling water	2–3 min. in boiling water	2–3 min. in boiling water	3–4 min. in boiling water	2–3 min. in boiling water	½–1½ min. in boiling water	2–2½ min. in boiling water	.....	6 min. with husks, 3–4 without	2–4 min. in boiling water
Goodale (1937)	2–3 min. in boiling water	5 min. in boiling water	.....	.....	2–3 min. in boiling water	2–3 min. in boiling water	2 min. in boiling water	.....	None	2–3 min.
Wiegand (1937)	2–3 min. in boiling water	2–3 min. in boiling water	2–3 min. in boiling water	3–4 min. in boiling water	2–3 min. in boiling water	½–1½ min. in boiling water	2–2½ min. in boiling water	.....	6–8 min. with husks, 6 without	2–4 min. in boiling water

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Joslyn, M. A., and Marsh, G. L. (1933). Changes occurring during freezing storage and thawing of fruits and vegetables. *Calif. Agr. Expt. Sta. Bull. 551*, 1-40.

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Arighi, A. L., Joslyn, M. A., and Marsh, G. L. (1936). Enzyme activity in frozen vegetables. *Ind. Eng. Chem. 28*, 595-598.

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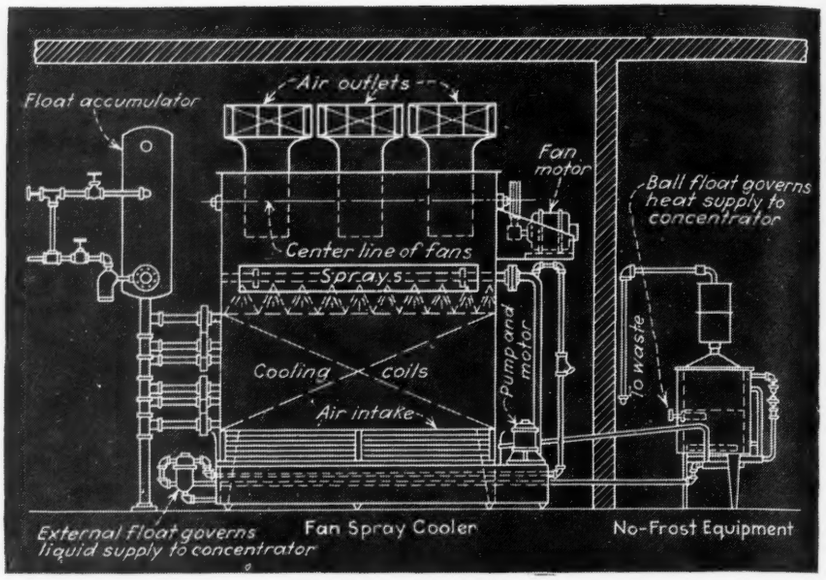
Goodale, Ralph S. (1937). Facts about freezing foods. Pamphlet published by Food Lockers, Inc., Marshalltown, Iowa.

Smart, Helen, F., and Brunstetter, B. C. (1937). Spinach and Kale in frozen pack. *Food Research 2*, 151-163.

Wiegand, E. H. (1937). Experimental results on the preservation of fruits and vegetables by freezing. *Oregon Agric. Expt. Sta. Circ. 122*, 1-12.

Diagram of connections of single air cooler and concentrator for "no frost" liquid. In the installation in the Washington plant of Standard Brands, described in this article, two cooling units are served from the same concentrator.



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Editorial Consultant
Food Industries
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IMPROVED ANTI-FREEZE for Air-Cooling Units

ANTI-FREEZE SOLUTION containing an organic liquid instead of a salt brine can be substituted in air-cooling units of the type built by Niagara Blower Co. This modification of refrigeration practice with Niagara "No Frost" liquid has been used successfully in the yeast storage rooms of the Fleischmann plant of Standard Brands, Washington, D. C., for nearly a year. Freedom from salt troubles, and more nearly continuous operation, are the major advantages recognized by the management of this works.

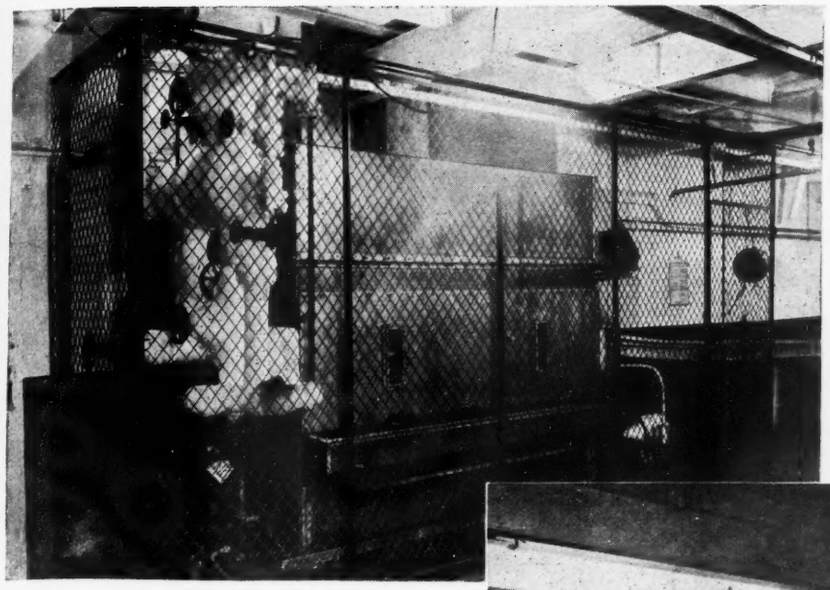
The fundamental job of a non-freezing solution in an air cooler of this type is to give continuous and undiminished rapid transfer of heat from air to the ammonia cooling coils. Theoretically, pulling the air over these coils, maintained at a low temperature by the ammonia refrigeration, would suffice without any anti-freeze liquid. But the cooling capacity of the coils would be much less in the absence of liquid, and the heat transfer would slow down rapidly as frost built up on the outside of the pipes. For this reason, brines of either common salt or calcium chloride have been generally used.

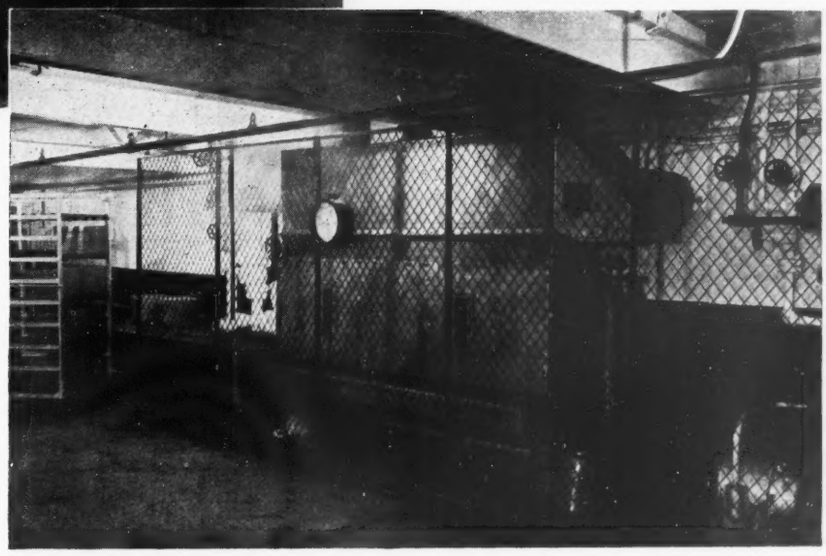
The brine is pumped in through sprays above the cooling coils in such a manner as to flush off all of the coil surfaces and to give the maximum chilling exposure to the air by contact both with the coils and the liquid. All designers of air-cooling units undertake to distribute this flushing liquid so that most intimate contact with both air and coils will be accomplished. Unfortunately, with intermittent operation, brine may dry on the eliminator plates in such a way that air does not pass through uniformly. The efficiency of such a unit is reduced and, in extreme cases, brine spray carry over may occur. With the new type of organic anti-freeze liquid the possibility of encrustation is eliminated and the probability of uniform functioning greatly increased.

With salt or calcium chloride brines the job of cleaning out the refrigerating equipment and washing down any spray residues is a messy task. Although theoretically this job should not be required at all frequently, most careful managements do find it necessary to shut down at intervals of a few weeks in order to clean up both the refrigerating unit and, to some extent, other parts of the cold room. Occasionally, a more serious operating difficulty is met in the formation of salt crusts on the air fans, causing irregular or noisy operation, with danger of actual breakdown if the fans are not cleaned and restored to proper balance.

All this explains why the new solution used by Fleischmann was proposed as a substitute for brine. This is a non-freezing organic liquid, somewhat similar to anti-freeze solutions used in automobile radiators. It has a high boiling point to permit evaporation of the water from the diluted solution and efficient complete return of the no-frost liquid to the coolers. The solution may be used with or without an inhibitor, depending upon the character of the metals of the cooling equipment and the consequent prospect of corrosion.

The Fleischmann plant in Washington, D.C., where the first commercial use has been made of this new anti-freeze liquid, employs two Niagara air coolers in the yeast storage room. Each is an all aluminum chamber, designed for brine spray and to handle 6,700 cu.ft. of air per minute through four fans operating on a single shaft. A 2-hp. motor drives this fan, and a 3-hp. pump motor provides for liquid circulation. The ammonia cooling coils of each unit are approximately 350 lineal feet of aluminum tubing of 1-in. outside diameter. When operated under full flooded condition, with ammonia at 8 lb. back pressure (or—12 deg. F.) the unit is rated at 8.5 tons of ice per 24 hours. If more cooling were required





The two unit coolers used in the Washington plant of Standard Brands. The concentrator is located above the units and cannot be shown photographically.

here, by operation at 5 lb. back pressure (or—17 deg. F.), a rating of 10 tons per 24 hours would be reached.

These two air coolers are automatically controlled in such a fashion that one unit cuts off when the air temperature in the room reaches 32 deg. F. The other continues pumping solution until a slightly lower temperature is reached, generally 30 deg. F. Under many circumstances a single cooling unit thus suffices for maintenance of room temperature; but in the summer season both units operate most of the time to maintain the desired storage temperature.

These two coolers discharge the air in the upper section of this room, which is approximately 20x40 ft. and 16 ft. high. By having four air outlets on top of each cooler unit, good distribution and uniform temperature are maintained. In fact, the cooling results are definitely superior to those previously obtained when large cooling coils in a loft above the false ceiling of the room were the source of refrigeration. The air intake for each unit is an open section the full length of the cooler along the side toward the room, just above the liquor pan level.

Automatic temperature maintenance by the thermostats already mentioned, operates only on the liquid circulating pumps of the coolers. The air fans run continuously in order to maintain circulation throughout the room for uniform temperature. During week end periods, when no stock is being put into the room for chilling and no handling of goods in and out is necessary for packaging or deliveries, it is feasible to cut off this automatic operation for considerable intervals, thus saving power. Under those circumstances, manual operation is arranged for the liquid pumps. These are then turned on by hand for a short time as required at intervals to prevent heavy ice accumulation on the coils.

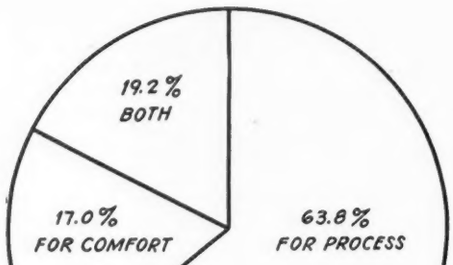
During normal automatic operation, a small quantity of the liquid is drawn off continuously from that one of the coolers which is set a few inches lower than the other. The liquid, which has been diluted slightly by the moisture taken out of the room, passes out of a small connection at the discharge of the circulating pump which forces it into an elevated "concentrator." There the liquid is boiled by submerged steam coils and the surplus water eliminated. A two-stage boiler is used, in order to trap liquid that might be carried over mechanically from the first boiling unit. The reconcentrated liquid overflows out of the first and second concentrator chambers back into the feed tank of that cooler which is at the higher level.

During manual operation it is not necessary to maintain the automatic reconcentration of the liquid, as the dilution going on is relatively slow because comparatively small quantities of humid air get into the room when the doors are kept well closed.

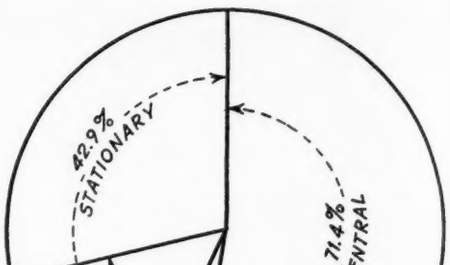
Regulation of the concentrator unit is very simple. It has been found by experience that by maintaining the steam supply to the unit at just 7 lb. per sq.in. pressure, the quantity of heat is just enough to care for the quantity

(Turn to page 416)

▶Food manufacturers using unit coolers will note in this article an innovation that may offer them some direct saving but offers an even more important advantage in uniform dependable operation. These advantages can be realized by
All Food Manufacturers



How food manufacturing establishments make use of air conditioning.



Types of air-conditioning equipment used by food plants.

HOW Food Manufacturers USE Air Conditioning

By G. L. MONTGOMERY
Managing Editor, Food Industries

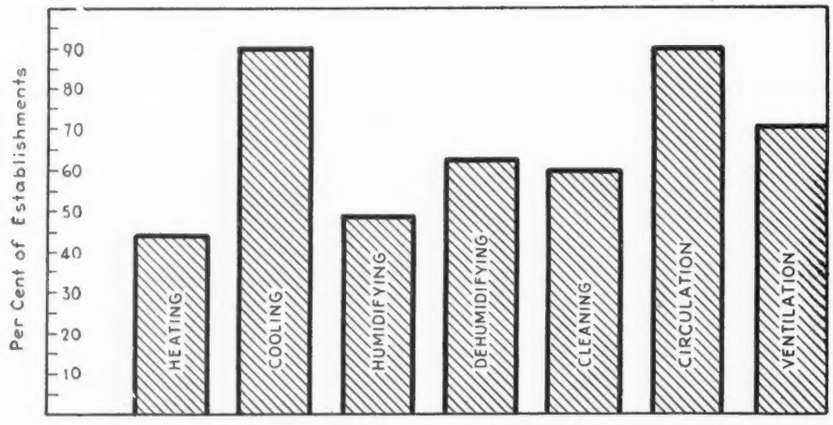
PROCESSING NEEDS are the major influence behind the purchase of air conditioning, according to a recent survey made by FOOD INDUSTRIES. This survey covered 96 leading food manufacturing plants, of which 52 were found to have air-conditioning installations.

These plants included sixteen confectionery manufacturers, eight meat packers, six market milk plants, five bakeries, five producers of canned foods and other grocery products, five breweries, two producers of flour and other grain products, one frozen fruits and vegetables producer, one molasses plant, and one packer of fish. The largest of these plants had 2,000 employees, and the others ranged downward to just under 100 workers.

Of the various plants surveyed, it was found that 63.8 per cent used air conditioning for processing alone, while 19.2 per cent employed it for the comfort of the employees, as well as for processing purposes. The remaining 17 per cent used the equipment for comfort alone. Among the operations carried out by the air-conditioning installations studied, it was found that 90 per cent were used for cooling and for air circulation, 70 per cent for ventilation, 62 per cent for dehumidifying, 60 per cent for air cleaning, 48 per cent for humidifying, and 44 per cent for heating.

Central air-conditioning installations are by far the most used by food manufacturers. Of the plants covered in the survey, 71.4 per cent of those using air conditioning had central systems, 42.9 per cent had stationary unit systems and 4.1 per cent had portable unit systems including duplication.

(*Turn to page 416*)



Unit operations in food plants carried out through the use of air-conditioning equipment. Percentages total more than 100 because some plants use the equipment for two or more purposes.

Transporting Frozen Foods

Railroads and trucks divide the bulk shipments, but problems arise in handling less-than-carlot and sample loads.

By IVAN C. MILLER
Distribution Editor, Food Industries

UNTIL THE LAST TEN YEARS, fresh fruits and vegetables moved from the producing areas to the major markets largely by rail, a portion requiring refrigeration, a larger portion moving from producer to market without refrigeration.

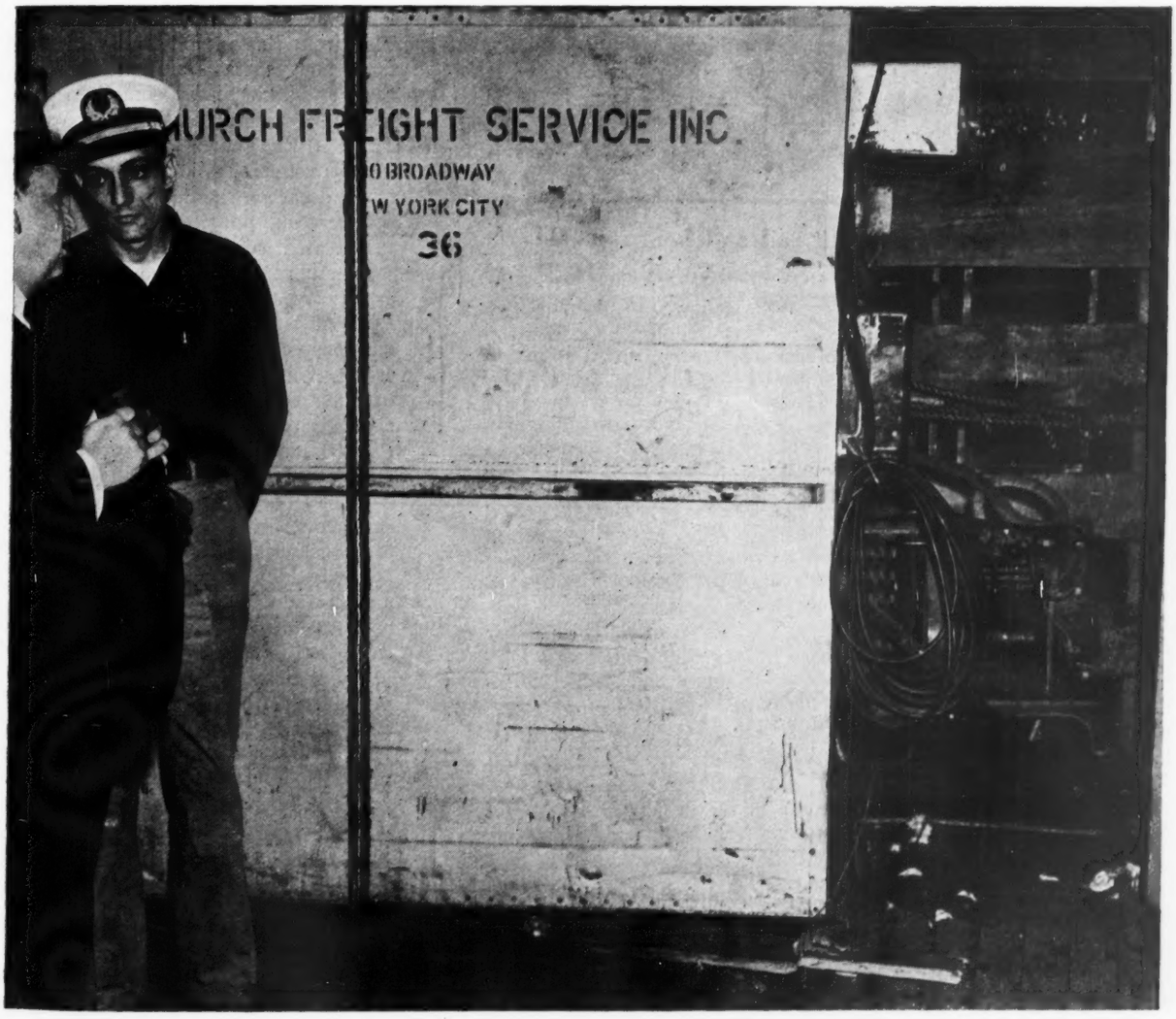
During the last ten years, transportation of fresh fruits and vegetables has been to an increasing extent by truck. The railroads now transport but little over half of the long haul fresh produce delivered to the major markets.

Reference to the tables will indicate that truck unloadings at Boston between 1929 and 1936 increased from 2 per cent to 31.8 per cent, at Denver from 28 per cent to 40.6 per cent, at Los Angeles from 57 per cent to 82.8 per cent, New York from 8 per cent to 38.8 per cent, and in Salt Lake City from 40 per cent to 73.4 per cent.

The advent of frozen foods opened a field which gave the railroads an opportunity to recoup ground lost to the truck. Long distance carlot shipments of frozen foods have so far accrued almost entirely to the railroad. But there is no record that the railroads have made any attempt to obtain l.c.l. shipments of frozen foods.

For many years, coldpack frozen fruits have moved across the country in refrigerated freight cars (about 10 per cent of the cold packed fruits moved East from the West Coast by boat).

Quick frozen fruits and vegetables from the Northwest are transported to central and Eastern markets entirely in refrigerated railroad cars.



Church Freight Service, Inc., container just after unloading first shipment of frozen pineapple from Cuba which arrived in New York on a United Fruit Co. boat early last month.

The major problem in frozen food transportation is the maintenance of uniform low temperature. The present method is to precool the refrigerator car for 24 hours with a salt and ice mixture. As the bunker is filled, various amounts of salt are added, to the bottom quarter 20 per cent salt, second quarter 15 per cent, third quarter 20 per cent and to the top quarter 30 per cent. This method of refrigerating frozen food shipment from the West Coast brings the product to the New York warehouse at a temperature of 8 to 10 deg. F. Though the railroads cooperate in following a definite icing plan, and follow an icing schedule, frozen food shippers generally install a recording thermometer in each car to be certain the products have been under constantly controlled temperature. For this type shipment, Pacific Fruit Express cars, especially insulated for frozen food transportation, are used. The cost of maintaining low temperature on a car of frozen food across the country from the Pacific to the Atlantic Coast is approximately $25 more per car than the cost of regular refrigeration.

At present, trucking service does not compete with railroads on long distance hauls over the mountains from the West Coast. The long distances and heavy duty hauling has precluded truck competition. However, on hauls of less than 300 miles, trucks are extensively used, especially within the area of New York City.

Markets	1935 Unloads		1936 Unloads	
	Truck Receipts	Car Lots Rail & Boat	Truck Receipts	Car Lots Rail & Boat
Atlanta	8728	3219	11183	4096
Boston	14974	37802	16408	37322
Chicago	10477	61271	5511	63336
Kansas City	2669	11378	2057	12704
Los Angeles	53726	11235	57069	11034
Milwaukee	984	7370	582	8433
New York	65259	123106	71167	115921
Philadelphia	.....	36471	30915	37825
Pittsburgh	2005	22646	1521	25429
St. Louis	3610	19396	2257	20408
San Francisco	14038	8179	14194	8107
Total	176470	342073	212864	344615
Per Cent	34.0%	66.0%	38.2%	61.8%

The comparative importance of the above eleven markets for fruits and vegetables is indicated by the following:

Total car-lot shipments of 43 important fruits and vegetables by boat and rail in the United States:

1935	1936
820,897 cars	796,938 cars

Per cent of above shipments unloaded by rail and boat in the eleven markets:

1935	1936
43%	42%

Comparison of motor truck with rail and boat unloads of fruits and vegetables at six representative cities, 1929

City	State of origin of truck unloads	Car-lot rail and boat unloads from — All sources [2] *Cars*	Estimated truck unloads from beyond market garden area [1] Quantity *Cars*	Relation to all unloads from beyond market — garden area *Per Cent*
Boston	Massachusetts, New Hampshire, Vermont, Maine, New York, New Jersey, Connecticut, Maryland, Virginia, Rhode Island.	44,728	859	2
Cincinnati	Kentucky, Ohio, Indiana, Tennessee, Michigan	15,184	740	5
Denver	Colorado	6,074	2,326	28
Los Angeles	California, Mexico, Arizona.	20,065	26,448	57
New York	Connecticut, Delaware, Maryland, New Jersey, New York, Massachusetts, Pennsylvania, North Carolina, Virginia, Rhode Island.	186,288	16,374	8
Salt Lake City	Utah, Nevada, California, Idaho.	1,845	1,232	40
Total		274,184	47,979	15

[1] The market-garden area is considered that area in which the market-garden type of farming is practiced and from which transportation would be by wagon if trucks were not available.

[2] Bananas are not included in the unloads.

Fish from Boston and Gloucester and fruits and vegetables from New York State and New Jersey, come into New York City almost entirely by truck. These trucks have insulated bodies. Temperature is maintained by the use of solid carbon dioxide or mechanical refrigerating units.

Insulated refrigerated trucks have successfully transported fish and oysters over long hauls of more than 1,000 miles. A few frozen food shipments have been made by truck over equally long hauls in the East. As trucking equipment and methods improve, trucks will threaten all railroad transportation of frozen foods except the mountain hauls in the West.

Trucks handle practically all l.c.l. shipments from the local warehouse to distributors and retailers. Solid carbon dioxide is frequently used to maintain low temperatures on this type of frozen food movement, making deliveries from warehouse to institution or retail outlet. Low temperature brine precooled trucks, silica gell and mechanically refrigerated trucks are also used. However, in some cases merely the insulated truck is used to preserve temperature. In this type of delivery system faith is placed in the hope that the time element between loading the truck and delivery will be sufficiently short so that the temperature of the frozen product in the truck will not have time to rise above 10 deg. F. Although this practice is seldom used in summer, it is a practice which is certain to result in lower

(*Turn to page 417*)

By IVAN C. MILLER
Distribution Editor, Food Industries

Posters CREATE SALES in Montclair, N. J.

Elmer's Food Store window with a poster made from a reprint of one of the women's magazine food pages.

In today's market an idea that provides the means of maintaining sales volume of a grocery product is worth notice of every sales manager in the field. An idea which not only maintains volume, but delivers sales increases is worth more than notice. It merits careful study.

THE STRUGGLE to maintain sales volume is more intense today than ever before. New manufacturers are entering the field. Old manufacturers are extending the number of items in their line. Not only are new products numerous, but due to the progress of the self-service stores, many more items than formerly now compete for the consumer's dollar in each retail store.

As a result of this change, the retailer becomes of new importance to the food manufacturer. He becomes important again not because he is in a position to administer more sales pressure to one food product than another, but because he dictates what items shall be selected for special display. Among similar food items, of equal price and merit, the one prominently displayed will prompt sales.

The food manufacturer's problem is to get his product displayed, to get his product featured. It is easier to sell a retailer an order than to sell him the idea of a special display featuring the product. There are far too many requests for each retailer's limited display space.

During the last year, FOOD INDUSTRIES has reported the results of its own investigations of point of sale promotion, using displays built to support the editorial food pages of the women's magazines. Occasionally these displays have featured but a single food item. Usually, however, the displays have consisted of a group of related items, those required in the preparation of the meal or dish illustrated on the poster.

These tests have been made in all types of stores—chains, voluntaries, large and small independents and in super-markets. The following results were obtained from recent tests made in two stores in Montclair, N. J.

Elmer's Store is nestled in among chain and other independent competitors in the less ritzy section of Montclair's business district. The poster

Interior of Elmer's Food Store in Montclair, N. J.

used in this display, illustrating a meal centering around griddle cake sandwiches, suggested to housewives the purchase of pancake flour, bacon, syrup, coffee and tomato juice. The poster was the center of a window display featuring all of these items except the bacon.

The window display remained in effect two weeks, during which time no special prices or other inducements were offered on the featured items.

(*Turn to page 390*)

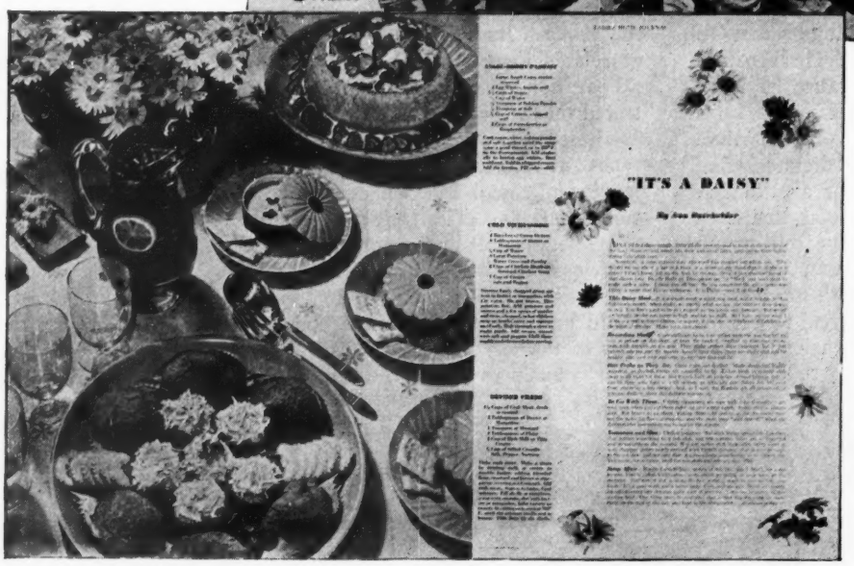
Elmer's Food Store draws heavily on the middle class.

Two-color spread which will appear in the August issue of McCALLS.

Good Old-Fashioned Pickles
All of them family favorites
All tested in our kitchens
at Good Housekeeping Institute
"Sugar and spice and all things nice."
That's what these pickles are made of.
GOOD HOUSEKEEPING INSTITUTE · KATHARINE FISHER · DIRECTOR

GOOD HOUSEKEEPING'S *August feature colored food page spread.*

This two-colored spread will appear in the August issue of PICTORIAL REVIEW-DELINEATOR.



LADIES HOME JOURNAL *food pages from the forthcoming August issue.*

IMPULSE SALES MAKE DIVIDENDS

The food pages of the August issues of the women's magazines, advanced proofs of which are reproduced here, will create impulse buying of the products illustrated when displayed on posters in retail stores.

A DESCRIPTION OF THE CONTENTS of the feature food pages of the forthcoming August issues of prominent women's magazines is furnished as a guide to manufacturers, the sale of whose product may be stimulated by using a store display built about reprints of one or more of these pages mounted to make posters.

PICTORIAL REVIEW DELINEATOR: Two-color spread titled "Sandwiches for a party or a meal," illustrates and gives recipes for a variety of sandwiches. Posters made for these pages suitable for promoting bread and sandwich filling, meat and meat spreads, cheese and cheese spreads, olives and other sandwich-making ingredients.

McCALL'S: Two-color spread with illustrations and recipes for six "short cut" dinner menus, suitable for promoting canned soups, canned peaches, tuna fish, gelatin.

LADIES HOME JOURNAL: Full-color spread, suitable for promoting cake-making ingredients, canned chicken soup and canned crab meat.

GOOD HOUSEKEEPING: Full-color spread featuring recipes for making "good old-fashioned pickles." This spread is suitable for promoting sales of vinegar and spices.

WOMAN'S HOME COMPANION: Full-color spread illustrating salad bowl and meat platter on a buffet luncheon. Suitable for promoting salad oils and dressings and meat cold cuts, olives and pickles.

This feature food spread will appear in the August issue of WOMAN'S HOME COMPANION.

During the two weeks of the window display, 136 containers of syrup moved out of the store. This gave the featured items an increase of 283 per cent above average sales. Log Cabin and Vermont Maid syrups were featured. Aunt Jemina pancake flour sales increased 233 per cent. Eighty-four packages moved from the grocer's shelves to housewives. Tomato juice and coffee moved in almost the same volume, 327 cans of tomato juice were sold during the two weeks of the display and 318 lbs. of coffee, corresponding sales increases were: tomato juice, 376 per cent; coffee, 269 per cent. The 88 lbs. of bacon sold represented an average increase of 367 per cent above the weekly rate.

It is worth noting that the sales increases were fairly consistent and uniform on all items featured. Also worth noting is the fact that this single two-week promotion increased sales of the featured items between 10 and 15 per cent for the year, presuming sales of these items did no more than remain average during the remainder of the year. Very little simple arithmetic is necessary to determine that this retailer took in during the period of his display more than $100 on plus sales on these featured items alone. Why shouldn't retailers be willing to give space to this type of display?

The Montclair Food Co., another store in which a poster test was recently made, has an advantage over Elmer's in location. This food store is in Montclair's ritzy business section where it has less nearby competition from other food stores.

The display poster featured by Montclair Food Co. was made from the food pages of a woman's magazine. The food item featured was baked beans. For testing the promotion value of this poster an inside table display was used. Only one item was featured, "Prudence Baked Beans."

Montclair Food Co., records show that in more than a year previous to the test, just six cases (72 cans) of Prudence baked beans had been sold, an average of less than two cans per week. During the six days the table display featured these Prudence beans and while the poster provided an impulse, nine cases (actually 110 cans) moved to Montclair kitchens. The percentage figures for the increase from less than two cans per week to 110 cans per week assume astronomical proportions. These posters, made by mounting on cardboard reprints of the colored and illustrated women's magazine food pages, with appropriate captions not only stimulate impulse sales and greatly increase sales volume thereby, but they offer a means of inducing retailers to display the products featured.

As a result of many tests Food Industries arranged with the women's magazines to obtain advanced proofs of their pages. The purpose of obtaining these advanced proofs is to describe and illustrate the forthcoming food pages of the women's magazines so that manufacturers whose product or products are among those featured may obtain ready-for-use posters bearing reprints of the food pages and place them in the hands of retailers at or about the same time the magazines reach their readers.

Mounted reprints of these food pages (single pages on 14x22 in. poster board, spreads on 28x22 in. poster board) may be obtained from the magazine ready for use at the following prices:

Single Page

1,000 to 1,999 inclusive each.....15c.
2,000 to 2,999 inclusive each.....12c.
3,000 and over each.....10c.

Two-Page Spread

1,000 to 1,999 inclusive each.....25c.
2,000 to 2,999 inclusive each.....18c.
3,000 and over each.....16c.

Manufacturers may either correspond with any one of the magazines direct, if interested in food pages appropriate for their products or write to the distribution editor of Food Industries.

Each poster will carry the printed line "As seen in the July issue of..... Magazine." The manufacturer's own selection of caption or "selling slug" such as, "Try these recipes suggested by Ladies Home Journal," etc., will be printed at the top of the poster. No poster will bear the name of the manufacturer or his trade brand.

Display poster used in Montclair Food Co. store test.

Montclair Food Co. store has for its customers many of Montclair's upper crust.

Montclair Food Co. store is not large, but carries a large variety of food including many in the luxury class.

Merchandising
HINTS AND HURDLES

Packaged Fish the Trend

THE ANNUAL REPORT of the Department of Commerce's Division of Fishery Industries for the year 1929 compared to 1936 shows a definite trend toward packaging fish for the consumer at the fishery. The number of pounds of fish packaged in fillets, steaks, sticks, tenderloin, etc., increased 44 per cent between 1929 and 1936. Eighteen per cent of the fish frozen in 1929 was packaged, 38.4 per cent of the fish frozen in 1936 was packaged. Between 1929 and 1936 there was an increase of over 300 per cent in the number of pounds of frozen fish packaged. As a result of this trend toward packaging of fish by the fishery, these industries are becoming more package conscious, giving consideration not only to the preserving qualities of the package but also to the merchandising value at the point of sale. Atlantic Coast Fisheries, New York, has recently introduced a new series of wrappers for its line of packaged fish. These vegetable parchment wrappers are gay of color, modernistic of design.

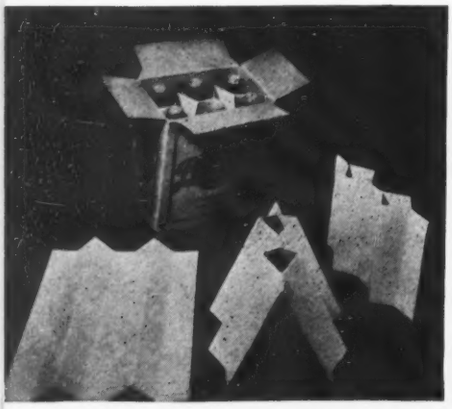
Production of Packaged Fish

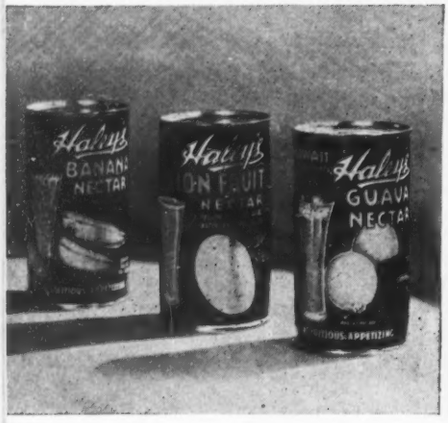
	1929	1936
Fillets fresh	55,095,723 lb.	49,647,396 lb.
Fillets frozen	21,632,860 lb.	61,802,657 lb.
Fillets smoked	1,685,355 lb.	.....
Steaks fresh	15,000 lb.	1,602,675 lb.
Steaks frozen	225,259 lb.	795,633 lb.
Sticks fresh	2,400,214 lb.	1,357,391 lb.
Sticks frozen	.....	6,278,316 lb.
Pan dressed fresh	3,291,094 lb.	.....
Tenderloin fresh.	61,000 lb.	.....
Total fresh packaged fish.	62,548,386 lb.	52,607,462 lb.
Total frozen packaged fish.	21,848,119 lb.	68,876,903 lb.
Total packaged fish	84,396,505 lb.	121,484,365 lb.
Per cent of packaged fish frozen	25.9%	56.7%
Increase in production of packaged fish between 1929–1936, — 44%		
Total fish frozen.	121,543,000	179,273,000
Frozen fish packaged	21,848,000	68,876,000
Per cent of frozen fish packaged.	18.0%	38.4%

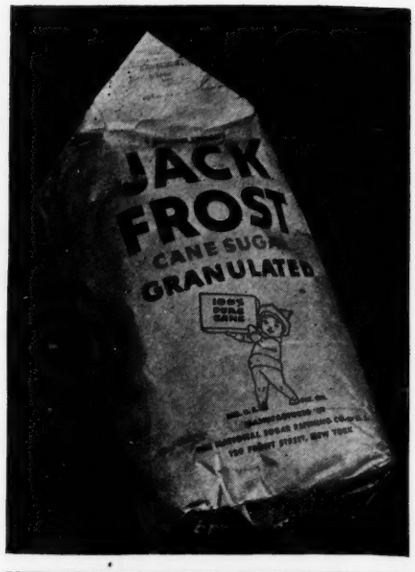
Figures from Div. of Fishery Industries, Dept. of Commerce.

Recently grocery stores have, and more and more they will encroach on the prerogative of the drug store by selling ice cream. Although canned baby food was introduced largely through the drug store, this at the time was no great encroachment by the drug store on the grocery. Baby food first followed the distribution channels of other items prescribed and recommended by the medical profession. Now, however, at least one drug store in Indianapolis, Ind., functions as a combined drug store and delicatessen, with both drug and grocery departments. This store combines pharmaceuticals, soda fountains, canned and frozen foods. The effect of frozen food on the channels of distribution is still unknown.

New







Novel Bottle Spacer

THE GULF BREWING Co., Houston, Tex., uses a novel spacer to protect the six bottles in its guest package of "Grand Prize" lager beer. The spacer made of plain cardboard obtains its effectiveness in spacing and protecting the bottles from breakage, merely by an ingenious method of folding. The spacer is economical of construction and design.

The Tropics Come to U.S.

BECAUSE OF THE PERISHABLE NATURE of many tropical fruits, little attempt has been made to market such products in this country (bananas, pineapples, dates and figs are not in this perishable class). Now, with the popularity of fruit drinks, "Guava nectar," "Passion fruit nectar" and "Banana nectar," products of Hawaiian Avocado Co., Ltd., Honolulu, Hawaii, are being introduced into this country. These tropical fruit juices are suggested as breakfast fruit beverages, pick-me-ups and as "mixes" in the preparation of cocktails and mixed drinks.

Potato Sticks Go "Ritz"

CANNED FRENCH FRIED and shoestring potatoes are not new. The potato prepared for the table is more and more finding its way to the market in cans. Now, however, the lowly potato has gone "Ritz". "O & C" brand potato sticks, shoestring style, product of Olney & Carpenter Co., Wolcott, N.Y., come to the market in vacuum packed lithographed cans.

Colored Sugars for Teas

PASTEL COLORED LOAF SUGAR, orange, yellow and green, is the product of the Maillard Corp., New York. These colorful flavored lumps of sugar are recommended for adding both color and flavor to grapefruit, salads, fruit cups, puddings, desserts, cocktails and teas. The product is attractively displayed in a transparent cellulose wrap.

Tea Concentrate Makes Debut

AFTER A NUMBER OF YEARS of experimental work, Wilson-MacNeal Co., Louisville, Ky., brings to the market a new concentrated liquid tea. "Miracle" tea concentrate, sweetened and ready to serve with the addition of ice water to make iced tea, hot water to make hot tea, saves the housewife the brewing labor in the preparation of hot or iced tea.

PACKAGES AND PRODUCTS

Kraft Paper Replaces Cloth

IN THE MIDWEST and some portions of the East, sugar in 5-lb. sacks is new being offered to the trade in kraft paper bags of the "pull-up-the-flap, cut-on-the-dotted-line" type. Retailers report consumer acceptance.

Canape for the Masses

A SMALL CRACKER CANAPE, crisp and crunchy and flavored with carroway seeds, is a new product of Beech-Nut Packing Corp., Canajoharie, N. Y. "Cocktailettes" packed 4¾ oz. in a transparent cellulose bag which retails at 10 cents, is a product geared for mass distribution in self-service stores.

Hospitality Reminder

VISITORS to the McCormick & Co. plant in Baltimore, Md., whether distributors or sightseers, are served a cup of tea in "Ye Olde McCormick Tea House," a replica of the Sixteenth century English tea house, built in on the seventh floor of the plant. The label of McCormick's orange pekoe banquet tea has recently been redesigned to include a reference to company's tea house and the new name Tea House Tea. The color combination remains the same.

Eye Appeal Package for Pepper

WHITE ROSE BLACK PEPPER product of Seeman Bro. Co. is now repackaged in a novel container with eye appeal. The container is a paper with a tin bottom and paper top with a hole for pouring, capped with a revolving perforated tin plate, held in place by blue paper collar. Black and white lettering on the metal foil label and blue enameled collar give the package eye appeal.

Wine from New Source

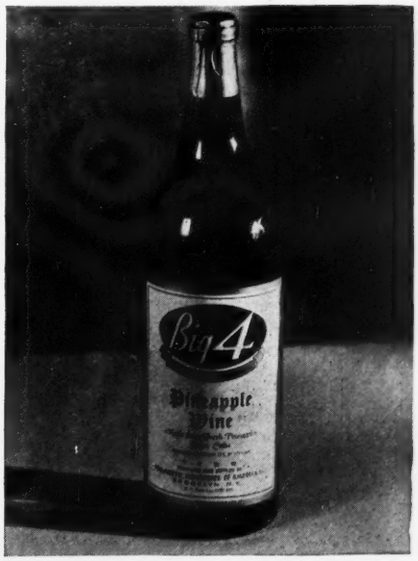
PINEAPPLE WINE made from Cuban pineapples, with an alcoholic content of 13 per cent by volume, has recently been introduced on the Eastern market. "Big Four" pineapple wine is the product of Vermouth Industries of America, Brooklyn, N. Y.

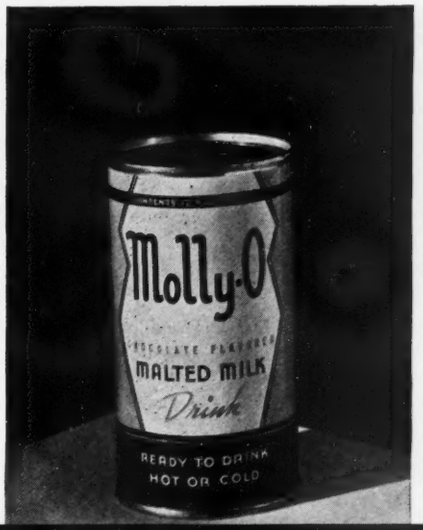
Canned Whole Malted Milk

THE INGREDIENTS for making chocolate milk drinks and chocolate malted milk drinks in syrup form and in powdered form are offered to the housewife from the shelves of most grocery stores. Preparation of a drink from these preparations requires mixing in the home. Chocolate milk drinks prepared by dairies are delivered to grocery stores, soda fountains, and at the doorstep ready for consumption. However, the chocolate malted milk as prepared at the soda fountain can still lay claim to popular favor. A new product has recently been introduced to the market which contests this favor. This product "Molly-O" malted milk drink, product of Molly-O Corporation, Chicago, is a homogenized whole milk, chocolate flavored malted milk, containing ice cream ingredients and stabilized. The product is ready for consumption as it is poured from the can. The canned product is to be a shelf item for the grocery store.

Canned Sweet Potatoes

CANNED WHOLE SWEET POTATOES is a new product of John H. Dulany & Son, Fruitland, Md. These ready prepared sweet potatoes provide the housewife an emergency shelf item free from the time-consuming labor of peeling and cooking, ready to candy, fry, saute and serve.





Distribution Costs CUT *By Lighter Truck Tanks*

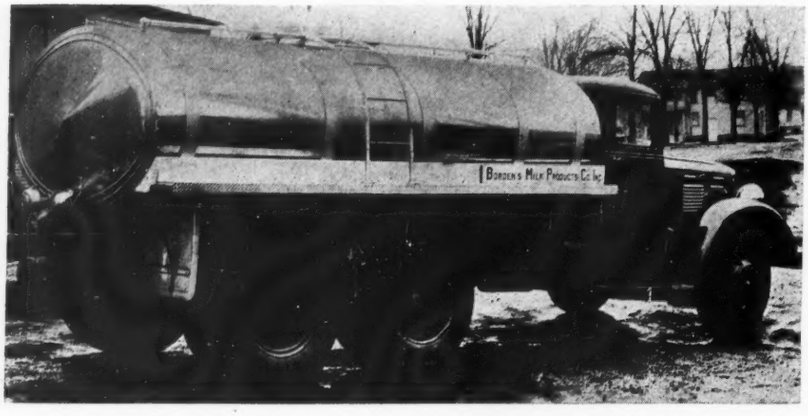
Weights of other bodies for food haulage also reduced by aluminum

IN THE NEVER-CEASING FIGHT to cut distribution costs, aluminum and aluminum alloys are playing an important role in the reduction of motor-vehicle dead weight. Most states now limit the gross vehicle weight to protect their highways against damage due to overloads. Thus, any reduction in the dead weight of the vehicle itself increases the pay load which can be carried. This in turn reduces the unit haulage cost.

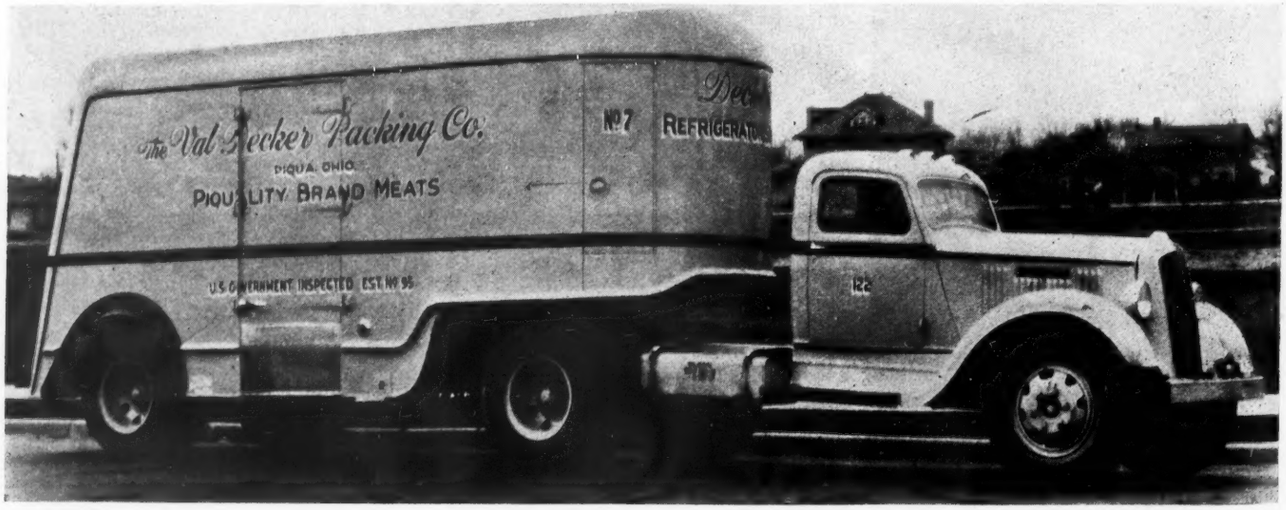
Aluminum has been for years a standard metal for household kitchen utensils. In the food industries, and especially in the dairy field, it has wide application in various equipment because it forms no toxic compounds with milk. Also, it does not affect the flavor, color, vitamins, enzymes, nutritional qualities or natural metal content of dairy products.

Aluminum, made under the tradename of Alcoa by Aluminum Co., of America, is available in all forms, including sheets, seamless tubing, castings, forgings, rolled channels and other structural shapes. It is this variety in the forms available that has accelerated the use of the metal in motor-vehicle bodies.

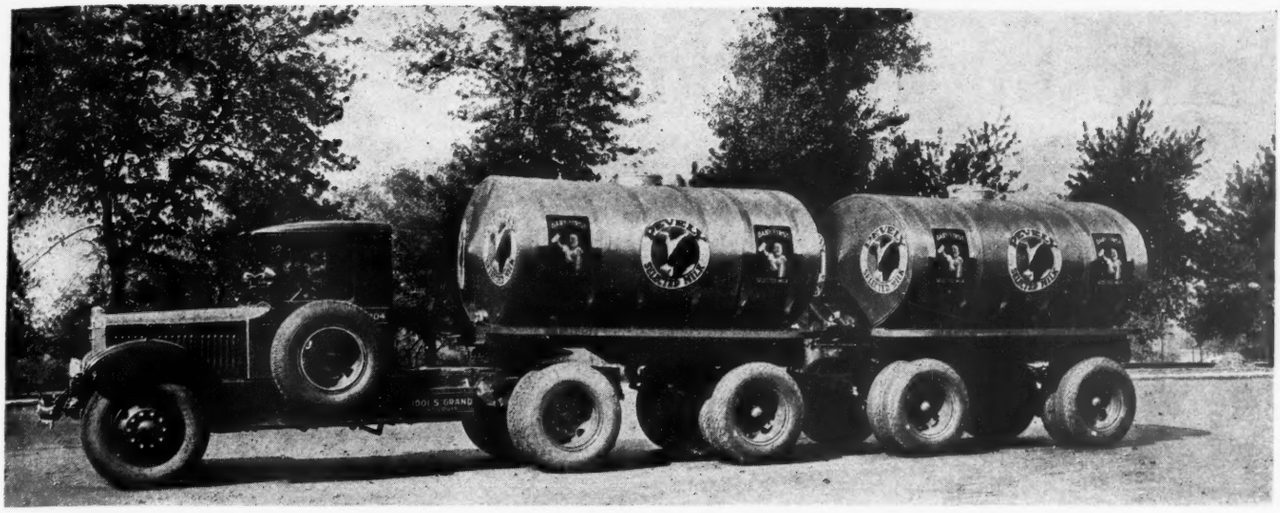
Aluminum truck bodies may be divided roughly into two general types—tanks for hauling fluids and the more conventional cubical bodies for handling other food products. In the dairy field, the aluminum tanks are used



Built of aluminum, with an outer aluminum shell, this Heil-made tank mounted on a Brockway ten-wheeler carries approximately 10 per cent more milk than would be possible with other types of tanks at the same gross vehicle weight. It is used by the Borden's Milk Products Co., Inc., at Arcade, N. Y.



The aluminum semi-trailer body above weighs 2,000 lb. less than a composite wood and steel body formerly carried on the same trailer chassis. This permits a 2,000-lb. greater pay load of meats on each trip. The reduced vehicle weight has meant a saving of between 6 and 7 gal. of gasoline per day on the empty return runs.



One of the outstanding aluminum-milk-tank installations, that of the Pevely Dairy Co., St. Louis, Mo. The tanks each carry 750 gal. more than the type of tank formerly used, the capacity of each tank being 2,293 gal. Strong alluminum alloy was used for the tank proper, with aluminum alloy sheet for the sheathing. Built by Heil Co., Milwaukee, Wis., the tanks were insulated with 2 in. of cork and have cast aluminum manholes and covers.

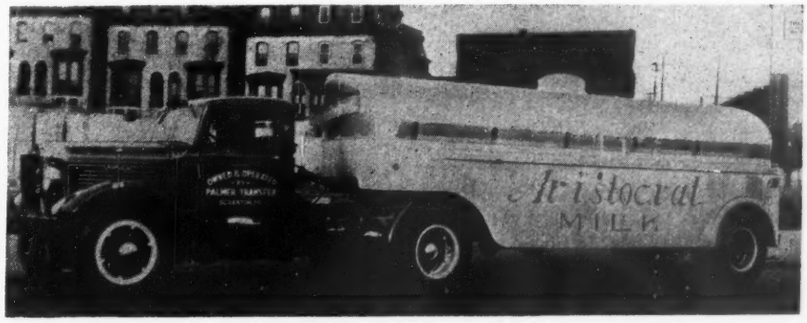
mostly for hauling fresh milk. To date, the largest tank truck has a capacity of 3,500 gal. It is used by Hershey Chocolate Corp., Hershey, Pa. The tank is mounted on a White ten-wheeler and carries approximately 10 per cent more milk than could be carried with the same gross vehicle weight if the tank were constructed of other material.

The cleaning of milk truck tanks is one of the most important factors in the operation of such equipment. Because nothing but milk can be carried in such tanks and meet the standards of various boards of health, the tankers run full inbound from the milk producing areas and return empty for their next loads. After the discharge of each tank load at the city pasteurization plant, the tank must be specially cleaned and sealed before milk can again be put into it. To prevent the growth inside the tank of bacteria which might contaminate the next load of milk, the rules and regulations covering tank cleaning are very strict.

These rules vary according to the health department regulations of the city into which the milk is brought. In general, they include washing with boiling hot water or live steam, together with a cleaning agent having a chlorine content. Men in clean white suits and rubber boots get bodily inside the tanks through manholes and scrub every inch of the interior tank surface, using electric drop lights to illuminate the tank.

Bacteria are likely to grow in any crack, seam, joint, rough spot or pit in the surface. Hence, in constructing the tank, the interior must be highly polished and all seams or joints smoothed. These precautions in manufacturing the tank, together with adequate cleaning in service, make the truck tank a satisfactory milk container. The easy workability of aluminum as a metal lends itself to the production of an exceptionally smooth surface. In fact, special precautions are taken in the fabrication of the aluminum-tank sheets to provide the most sanitary surface possible.

Now that suitable cleaners and chemical sterilizers are available, the care of aluminum apparatus is no more of a problem than the care of other tank materials. There are chlorine sterilizers on the market that are perfectly suitable for use in cleaning aluminum tanks. Two such sterilizers are Klen-O-Cide, made by the Klen-O-Cide Co., New York City, and Diversol with Aluminux, made by Diversey Manufacturing Co., Chicago.



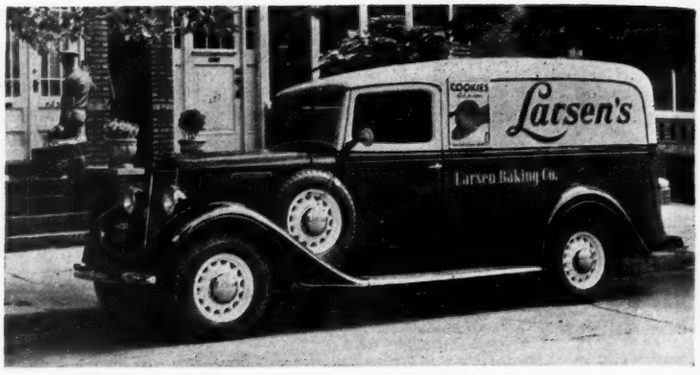
The weight reduction secured by the use of aluminum in the above tank made possible the use of a larger tractor. This provided more power to negotiate the mountainous country around Scranton, Pa. The unit is owned by Palmer Transfer Co. of that city and hauls Aristocrat milk on contract.

Truck tanks must be insulated to prevent the temperature of the milk from rising beyond certain limits while the vehicle is in transit. Here again, an aluminum product known as Alfol has an important weight advantage. The Alfol insulation consists of a number of layers of crumpled aluminum foil properly spaced. In insulating value, stability, cost and overall thickness, this insulation corresponds closely to the best grades of competing insulation now on the market. The Alfol, however, saves as much as 98 per cent of the weight. In addition, the foil has virtually no heat capacity, and it is therefore possible to precool or preheat more rapidly.

Other installations of truck milk tanks not illustrated herewith include those of Milk Cartage Corp., Pittsburgh; De Kalb County Agricultural Association, De Kalb, Ill.; and Franklin Ice Cream Co., Kansas City, Mo.

Choosing the Paint For Motor Vehicles

And some pointers on repainting them



THE BEST TYPES and colors of paint to use on motor vehicles are discussed by food fleet operators in the following symposium. And experienced opinion is given on maintaining the finish on these vehicles.

Synthetic Enamels Best

A color obtained from one pigment will resist fading and dulling to a greater extent than a color compounded of more than one pigment. Pastel shades are very delicate, and the more stable colors run to the dark rather than the light side. The lighter shades of brown, green or yellow are the easiest colors to keep clean from traffic dirt and road scum. However, these colors show up grease spots more pronouncedly than do the darker shades.

A combination of colors, using lighter shades in the upper half and darker shades in the lower half, tends to minimize the size of the truck unit. Likewise it is helpful to avoid blacking off the corners or roof moldings, as any type of wide striping will tend to outline the job.

As to the use of flashy colors, this raises the highly controversial question of the value of truck advertising. It is an intangible item and one to which I do not have the answer. Assuming a definite advertising value of a good looking type of vehicle, we question the advantage of a flashy-color job as compared to a well-painted, clean looking job of any distinctive color combination. Due to the lack of durability of the flashy colors, there is a possibility that as deterioration sets in the job loses its attractiveness very rapidly, which would seem to me to offset its earlier advantages.

I feel it is important on all types of bodies used in handling perishable foods products to use a paint which is effective in reflecting heat from the body. This applies particularly to the roof. Of all the types of paint material which we use for truck work, the best results are obtained from the synthetic enamels.

It is questionable if any special treatment for exteriors, such as waxing, is economical for the average fleet operator, because most motor vehicles are repainted not on account of deterioration of the paint materials but because of the ragged appearance a vehicle presents as a result of mars and scratches in panel surfaces from low hanging tree limbs, protruding objects, etc. Unquestionably, a wax coat over a finished surface will offer some protection against the elements.

Our average truck unit requires repainting every two or three years. This repaint program is established upon the basis of vehicle inspection and not according to any definite schedule. Minor disfigurations are taken care of as the opportunity is afforded. The majority of the minor ones are touched up by means of a brush. The major mars, requiring certain metal work, are refinished by spray gun.

In a few special instances we find it advantageous to operate our own paint shop, the majority of our units, however, are painted in outside shops. The disadvantage of operating company-owned paint shops is that the flow of work is not uniform and the necessary overhead during idle periods absorbs the saving that can be made on an individual unit cost comparison. Furthermore, the outside shops can render better service during your peak paint season, as in your privately operated shop you are limited to the volume of work that can be put through.—F. L. FAULKNER, *Automotive Department, Armour & Co., Chicago, Ill.*

Repaints in 18 Months

In regard to the colors which are best for painting large trucks and trailers to minimize their appearance of large size, we have a standardized color. It is not an easy color to keep clean, nor a durable color. It is a special cream. We believe that the colors we use have an advertising value regardless of their durability.

The finish which we have found most durable is synthetic enamel. As for using a protective coating of wax over the finish of motor vehicles, I believe that it would be an economical step, but we do not do this because of the time element and supervision necessary.

We have a schedule which calls for painting every eighteen months. In fleets as large as ours, we find that we can maintain a presentable appearance by routine painting schedule. Minor scratches on fenders are retouched immediately, and this work is done either by spray gun or brush. Out of 23 fleets that we operate, we have at the present time only one paint shop of our own. At all other garages the work is done outside.—D. R. BOYER, *superintendent of motor vehicles, Hathaway Bakeries, Inc., Cambridge, Mass.*

Distribution QUESTIONS CLUB

The PLANT NOTEBOOK

Conveyor Unloads Silos

A midwestern corn cannery stores husks, cobs, and other solid byproducts of its process in a number of large concrete silos, adjacent to the plant. During the winter months this material is sold to farmers of the vicinity as feed for livestock. The purchasers must load their own trucks and pay for the feed on a tonnage basis.

Due to the great cross-sectional area of these silos, considerable handling is necessary when material is removed. Trucks are first backed under a chute built into the silo wall. Material taken from the top of the pile is then passed through openings between the storage space and this chute, and falls directly into the truck bodies. Forking the heavy feed by hand from areas some distance away from these openings formerly required much time and effort. This extra work resulted in the space nearest the openings being dug out first, making it extremely hard to keep the silo contents level.

In order to speed up the loading operation and to avoid the troubles enumerated above, a lightweight trough conveyor is now used in the silos. This conveyor is built with its under-side inclosed so that it floats directly on the feed. A ball-bearing motor and speed reducing drive complete the assembly.

Current is supplied by means of a flexible rubber cable unwound from a reel mounted on a walkway at the top of the silos. Danger of shocks is minimized by grounding the motor and its starting device through an auxiliary wire forming part of this cable.

With the conveyor, which is light enough to be moved around by two men, all sections of the feed surface are easily reached and the only additional hand labor needed is that required to lift the material into the conveyor trough. Since it floats on the feed, the conveyor descends as the silo is emptied, unreeling cable as it falls. When all the feed is removed the conveyor is lifted with rope tackle and placed in the next silo—S. H. COLEMAN, *Roanoke, Va.*

V-Blocks Are Handy

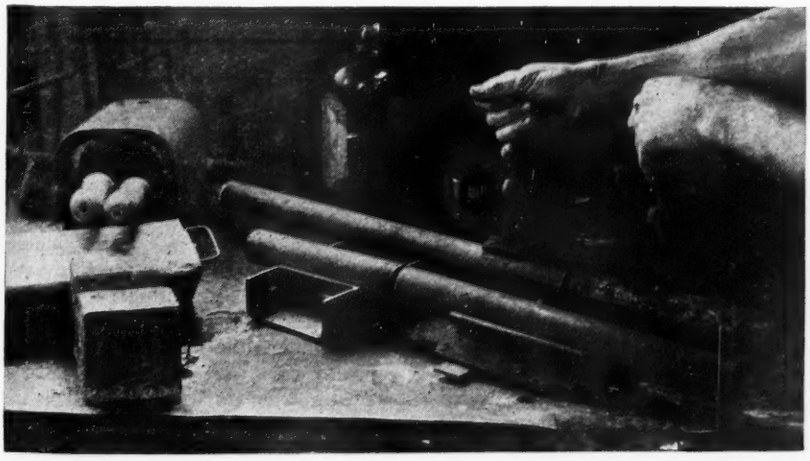
On the bench, at the drill press, out in the plant, or on any job where pipes, rods, pins or other objects must be held in line for drilling, welding or repairing, V-blocks are handy.

In the picture, at the left, can be seen two wooden blocks made from 4x4, with Vs in them. These are used to support Waltham-V refrigerating cartridges, when filling and soldering.

At the right, center, is shown a V-block made from three pieces of angle iron welded together at the ends, two pieces with the lips down and the other piece with the lips up. This serves to line up almost any job and is specially good in a confined working space.

At the left, center, is shown a piece of a truck frame in which a V was cut with a cutting torch. A piece of angle iron has been welded into the V. This is used on the bench and on the drill press to hold pins, rods or pipe in line.

At the extreme right of the picture, the hands are holding two C-clamps welded together with a U-bar. These clamps have angle iron V-blocks for jaws. They are useful for quickly setting a pipeline joint for welding and are particularly useful when working on a suspended joint for a steam, ammonia or other high pressure line requiring a strong weld.—BILLIE BURGAN, *San Diego, Calif.*



Four types of V-blocks that make maintenance and repair work easier.

Metal Spray Saves Equipment

Wear is one of the things that can be guarded against only in a measure. There cannot be any such thing as the prevention of mechanical wear on equipment. The best we can do is to prevent unnecessary wear, and to repair, as far as may be practical, such wear as is unavoidable, doing it periodically and systematically. Especially in the case of tin-coated equipment, where the coating may wear through on occasion, threatening contamination of food products and other like materials, it pays to have a thorough examination quite often.

The metal spraying gun is fast becoming a real boon in industry in this respect. By its use, a highly uniform and thorough coating of tin may be easily applied to worn places on equipment. It follows that any place that even looks suspicious may be readily coated, without actually waiting for spots on equipment to become altogether bare of tin.

The spraying of tin is of course the most important of all to the food industries, but it is interesting to note that all kinds of metals are being sprayed with guns of this type. There is no good reason why a second spraying gun may not be kept at hand for any other metal spraying demands that may arise.—J. E. HYLER, *Peoria, Ill.*

Truck Counter-Balances Underslung Loads

Shown in the illustration is a truck that is highly useful for moving various types of pails, kettles, etc., that are fitted with bails. While it is shown fitted with a hook for handling such loads, any number of modifications in design may be used. Various types of removable fittings may be kept at hand for the same truck. For instance, the truck may be fitted as shown for regular service, but the hook made removable and replaceable with a pair of tongs or a grapple for handling kegs or casks.

From the axle *B* of a pair of wheels *A*, there arises a pair of handles *C* which have been bent from pipe to

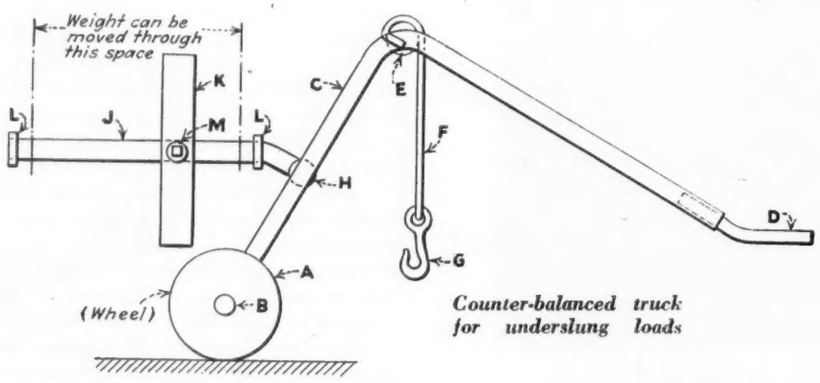
suit the purpose in hand. Obviously, the bend as shown is merely suggestive, and any type of bend may be employed that seems suitable. However, in any case, the pipe handles will come around as shown to receive two pieces of round iron or two smaller pieces of pipe *D*, which will be bent into a horizontal plane to serve as hand grips when using the truck. The general method of use is similar to that of a wheel-barrow, except for the fact that the load is underslung as already noted, and will barely clear the floor while being transported.

Across the two handles at the top, and between them, there is welded in a piece of shafting *E*, drilled to receive the end of a cable as shown. The end of the wire rope or cable *F* is a snug push fit in the drilled hole, and is tacked around the edges of the hole after insertion, by welding lightly. The hook *G* or other fitting is assembled to the wire rope in the regular manner. A chain may be substituted for the wire rope if that is preferred.

At any suitable point about as indicated, another piece of shafting, *H*, is welded into place across and between the handles, and out from its center there extends a piece of shafting *J*, the arrangement being such that it will lie normally in a horizontal plane. A heavy circular casting or steel plate *K* is drilled to slide on *J*, the limit of its travel being marked out by the two stops *LL*. It will be noted that a long setscrew *M* is provided in a countersink in the counterweight, to allow of fastening it at any point.

In the great majority of cases it will be possible to adjust the counterweight *K* so that little or no manual effort will be required in supporting the load being handled. Where a great deal of work of uniform type is to be done, the weight may well be set with considerable care, in order to realize the ideal condition.

An interesting variant in the manner of arranging a counterweight is to use, instead of an ordinary piece of shafting for *J*, a large section of heavy machine screw such as may be obtained from obsolete or outworn presses, etc., and then tap the hole in the counterweight to fit the screw. With such an arrangement, it becomes very easy to adjust *K* along *J*, simply by turning it, and a high degree of accuracy in setting is also very easy. Further, with such an arrangement, no setscrew is needed to hold *K* in place.—JOHN E. HYLER, *Peoria, Ill.*



Counter-balanced truck for underslung loads

Venting Open Heaters

If the temperature of water leaving an open heater is less than 210 deg. F. when there is ample exhaust steam, the probable cause is that the venting is not properly done. Even a very small amount of air will lower the temperature appreciably as will be seen from the fact that the presence of only 1 per cent of air in the heater (by volume of the steam space) will lower the temperature 40 deg.

Heaters are usually provided with good size openings for piping the vent, but these are often reduced by the operators to $\frac{1}{4}$ in. or thereabout. Many engineers believe that so long as there is some steam coming from the vent the heater is air free. But the air is mixed with the steam and for every cubic inch of air about 1,000 cu. in. of steam must come out.

In many cases a $\frac{1}{2}$ in. vent is sufficient and if this can be piped to the outside the arrangement should be satisfactory as the steam lost is negligible. But in other cases a vent larger than $\frac{1}{2}$ in. is necessary, as when the condensate from the heating system is returned to the heater through pumps. In such cases, the practice is to vent the heater through a condenser and recover the heat from the vented steam. Condensers for this purpose are on the market which are installed on top of the heater and through which the cold water first passes before entering the heater. However, for small installations and where the vented steam is not appreciable, a condenser can be made from pipe fittings, as is shown in Fig. 2.

Whether it pays to go to the expense of providing sufficient venting can be determined by balancing the cost against what can be gained. In the plant mentioned, under the existing conditions, the heater temperature was 180 deg. F. The size of the vent could not be increased, because it was not convenient to discharge the steam to the outside and a $\frac{1}{4}$-in. vent was as much steam as could be discharged inside the plant.

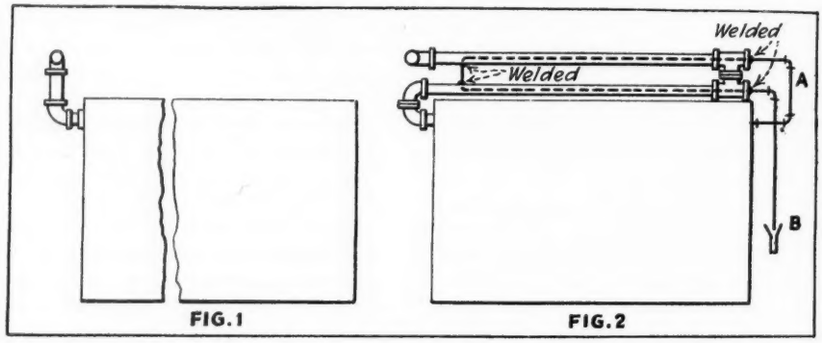


Fig. 1. Original installation at heater. Fig. 2. The water inlet was extended in the form of a U for the entire width of the heater. Through this U, made of 3-in. pipe, passes another U made of ¾-in. pipe. The vented steam and air enter at A and emerge at B as water and air, and are discharged to the sewer.

A temperature of 180 deg. F. was 30 deg. below what was possible and this was approximately 3 per cent loss in efficiency. With an annual fuel cost of $25,000 this plant had an annual loss from this cause of $750. Since the cost of making the change was much less than the possible saving, it was amply justified.

Aside from the gain in efficiency, higher temperature means lower dissolved oxygen in the feed water. This is desirable in any case and in plants that are having trouble with internal corrosion of boilers is of prime importance.—N. T. PEF, *Chicago, Ill.*

New DISCOVERIES AND INVENTIONS

FOOD ENGINEERING

Micro-organism Content of Dry Foods Reduced

REDUCTION in micro-organism content of spices, dried vegetables and fruits, nut meats, cocoa and flours through treatment with ethylene oxide at elevated temperature and under reduced pressure is provided for in U.S. Patent No. 2,107,697.

The dry food material to be treated is subjected to an 18-in. vacuum and heated to 220 to 240 deg. F. for 1 hour for the removal of moisture, air, and other gases that might interfere with the ethylene oxide treatment. Upon cooling the contents of vacuum chamber to 150 deg. F., the vacuum increases to about 28 in. of mercury.

At this temperature and reduced pressure, 1 lb. of ethylene oxide is admitted for each 35 cu.ft. of evacuated autoclave space. With the injection of the ethylene oxide the vacuum falls to 24 in. or lower depending upon the contents of the autoclave. The 150 deg. F. temperature is held for about 2½ hours.

Upon removal of excess ethylene oxide, the material treated is cooled and aerated either by passing air through the autoclave or by exposure to atmospheric conditions.

Per cents of kill are cited as being 99.15 to 99.4 for bacteria and 100 for yeast and molds when materials treated are contained in burlap, paper bags, or corrugated paper cartons.

The patent was granted to Carroll L. Griffith and Lloyd A. Hall who have assigned it to Griffith Laboratories, Inc., Chicago, Ill.

QUICK FREEZING

Promising New Varieties of Lima Beans For Freezing

AS POSSIBLE SUBSTITUTES for Henderson Bush lima beans for freezing there are four other varieties that seem to be very satisfactory. These are: U.S. No. 2, an early maturing strain of the Henderson type.

Maryland Thick Seeded, which is very small podded and has thick seeds. It is not yet available in commercial quantities.

Baby Fordhook, which has pods and beans that are slightly larger than Maryland Thick Seeded and runs uniform. Not available commercially until 1939 or 1940.

Illinois Baby Potato, plants are uniform, but there is some variability in pod-size and maturity. Because of the long growing season it requires it would probably not be suitable for a succession crop for peas.

When cooked after several weeks of freezing storage, the judges ranked these varieties above the Henderson Bush because of their brighter green color, their greater tenderness, and their mild, pleasing flavor.

Digest from private communication from R. C. Wright, physiologist, and Roy Magruder, olericulturist, Division of Fruit & Vegetable Crops and Diseases, Bureau of Plant Industry, U. S. Dept. of Agriculture.

METHODS OF PRESERVATION

Mold Control During Egg Storage

AT THE Fact Finding Conference of the Institute of American Poultry Industries, Chicago, Jan. 26-27, Dr. W. L. Mallmann and Miss Catherine Michael, Department of Bacteriology and Hygiene, Michigan State College, East Lansing, Mich., presented a paper on "Mold Formation on Eggs and Egg Packages." They have spent the last year and one-half isolating molds of all sorts from eggs, cases, fillers and flats, supplied to them from cold storage plants in the Central West. To date they have isolated a total of 315 cultures. All of the 315 cultures were classified into twenty genera. Over half of the molds belong to the *Penicillium* group. These studies are being continued with the idea that a complete report of their findings will be available this fall.

Using these molds as test organisms, an extensive study of means of control is in progress. Several chemicals have been found which suggest a means of control through keeping the eggs in contact with a sufficient quantity of the chemical to prevent the growth of the mold.

Successful applications of these laboratory findings under practical conditions will make possible the raising of the humidity of the storage room and the placing on the market a better storage egg.

BAKERY PRODUCTS

White vs. Whole-wheat Bread

IN PASSING FROM WHITE BREAD to whole-wheat bread, the dietary benefit is less than is popularly supposed, and is actually accompanied by certain alimentary losses. True, whole-wheat bread is slightly richer in phosphorus, but as the phosphorus intake is in no danger of being deficient with white bread in the diet the difference is not significant. Again, in the matter of vitamin content, persons on a general diet will experience no significant benefit from whole wheat as compared with white bread. These conclusions are based on chemical and dietary studies of the so-called 70, 75 and 80 per cent wheat figure. The importance of the germ in the wheat grain is greater than its small size (about 1.5 per cent, of the weight of the grain) would indicate. Unfortunately, flour cannot be milled and sold in the usual way with the germ left in, because it will make the flour rancid—hence modern milling takes out the germ. Only flour made for bakeries and used promptly after milling can retain the germ. Even then, if opportunity is given for the enzymes of the germ to exert their influence, the quality of the bread suffers, especially in loss of digestibility and food value. In general, it may be said, the public preference for white bread is sound and should not be discouraged.

Digest from "Alimentary Quality of White Bread," by E. Fleurent. *Chimie et Industrie*, 38, 419, 1938. (Published in France.)

BEVERAGES

Sugars for Champagne

FOR THE SECONDARY, in-bottle, fermentation of dry champagne, it is possible to use cane or beet sugar, dextrose or anhydrous dextrose, or

(*Turn to page 410*)

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Dual Purpose Milk Cooler

NIAGARA BLOWER CO., 6 E. 45th St., New York, N.Y., is making the "Dual" cooler for milk plants. This device serves two purposes: It supplies chilled water at 35 deg. F. to cool milk as it comes from the pasteurizer. It also serves to hold the cold bottled milk storage room at 38 to 40 deg. F.

The device is to be located in the milk room, and therefore requires no insulation. It embodies a cooling coil through which refrigerant is circulated. Water is sprayed over this coil, becoming chilled. Air is drawn up through this chilled water spray and discharged through diffuser outlets to cool the milk storage room.

After passing over the coils, the chilled spray water collects in a sump. From there it is pumped into the cold half of a cooling coil where it finishes the cooling of pasteurized milk that has first been cooled by city water. From this coil the chilled water completes a circuit back to the sprays.

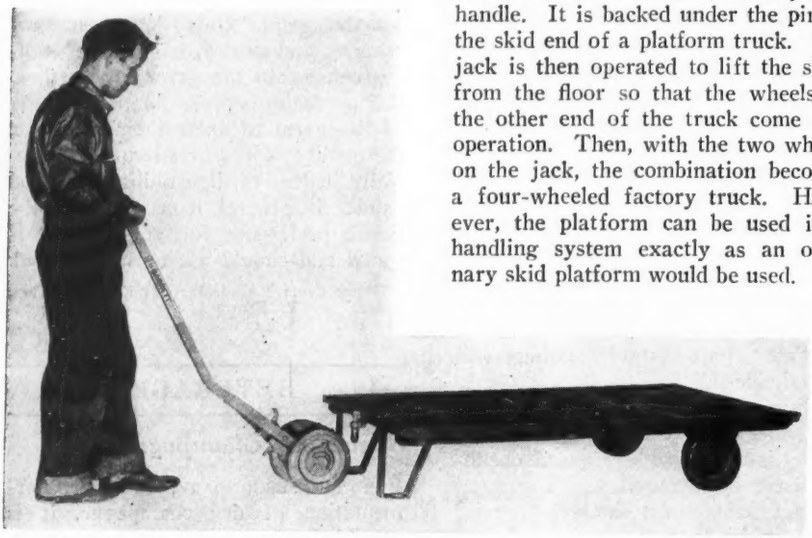
The cooler operates with a refrigerant temperature of 28 deg. F., permitting operation of the compressor at high suction pressure and thus saving in power consumption. This refrigerant temperature also guarantees against freezing of the milk and frosting of the coils.

Inverted Bucket Trap

SARCO CO., INC., 183 Madison Ave., New York, N. Y., are making a new straightway type inverted bucket steam trap. Known as Type BM-O, this trap is available with $\frac{3}{8}$ or $\frac{1}{2}$ in. inlet and outlet connections. These connections are arranged on opposite sides of the body on the same center line, to provide a straight-through connection. This is said to simplify the piping, particularly on small equipment. All the working mechanism is attached to the trap cover, so that it can be removed without disturbing the pipe connections. A Sarco strainer is built in so that no separate strainer is necessary.

Lift-Jack for Hand Trucks

BARRETT-CRAVENS CO., 3255 W. 30 St., Chicago, Ill., has developed a new lift-jack for use with their "Jackit" truck. As can be seen in the accompanying photograph, this is a jack unit mounted on two wheels and carrying a handle. It is backed under the pin on the skid end of a platform truck. The jack is then operated to lift the skids from the floor so that the wheels on the other end of the truck come into operation. Then, with the two wheels on the jack, the combination becomes a four-wheeled factory truck. However, the platform can be used in a handling system exactly as an ordinary skid platform would be used.



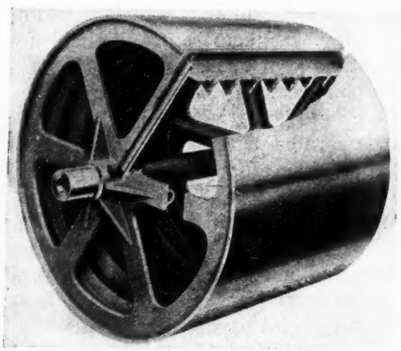
Detachable lifting jack and semi-skid platform form a factory truck when combined.

Gas Separator

A NON-CONDENSABLE GAS SEPARATOR for refrigerating systems, called the Hill Separator, is manufactured by Hill Mfg. Co., 370 Lexington Ave., New York, N. Y. In use, this device removes non-condensable gas from the ammonia system. It reduces power requirements, and saves ammonia, refrigerating capacity, oil, packing and maintenance. Four sizes are available to meet the requirements of a wide capacity range of refrigerating systems.

Drum Dryer

A NEW TYPE of welded steel drum dryer has been developed by Lukenweld, Inc., Coatesville, Pa. It operates with steam or other heating media, and is capable of providing controlled steam distribution at pressures up to 150 lb. It is made in all sizes up to 15 ft. in diameter with shell face size limited only by transportation restrictions.



Cut-away view of double shell dryer.

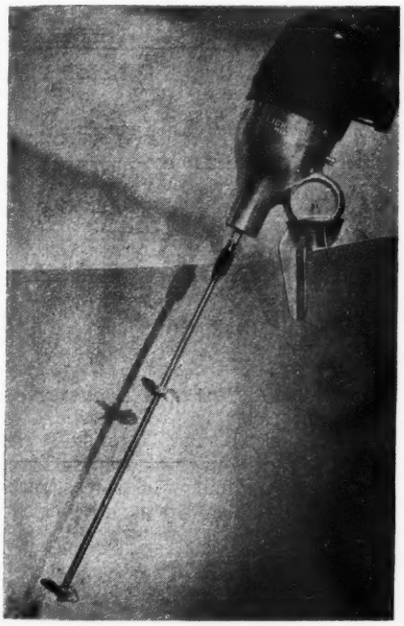
This dryer is made in either single or double shell construction. In the single shell type, the steam circulates within the dryer drum. In the double shell type, the steam enters through the journal at one end of the dryer, passes through inlets in channels welded integrally with the spokes and is confined in compartments formed in the jacket made by the outer and inner shells. Each of these compartments is individually supplied with

steam. The condensate is automatically and continuously drained off through the outlets in the channels welded to the spokes. Inlets and outlets of the channels converge at a revolving steam joint at the end of the journal.

In both the single and double shell dryers, the outer or drying shell is made from a special close-grained steel, with a ground and polished drying surface. This surface can be furnished in chromium plate when desired.

Sealed Bearing Mixer

MIXING EQUIPMENT CO., Rochester, N. Y., has added a sealed bearing mixer to its line of "Lightnin'" portable mixers, for use in applications where it is necessary to be certain that no grease gets into the mix.

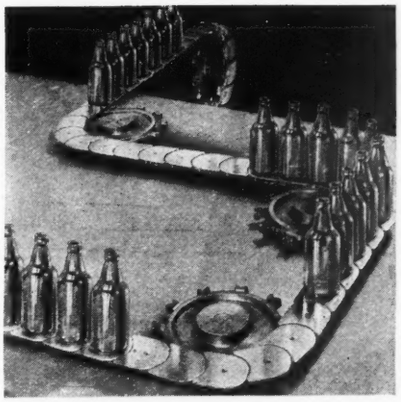


Sealed bearing portable mixer

This mixer uses a new type of prelubricated sealed ball bearing in the extended bearing. The life of this bearing, after extensive tests, has been determined to be even longer than the life of a standard bearing.

Two-Plane Conveyor Chain

LINK-BELT CO., 307 N. Michigan Ave., Chicago, Ill., is making a "Universal Carrier Chain," for use in conveyors handling bottles, jars and cans, particularly where both vertical and horizontal changes in direction are made. This chain permits sprocket engagement in two planes. It is constructed to provide a continuous, unbroken carrying surface of equal width, whether the chain is moving in a straight line or



Conveyor chain designed to move in horizontal and vertical paths.

turning around a sprocket wheel. It permits the use of a continuous chain in a conveyor system, using only one driving mechanism.

The two plane travel feature makes this chain practical for use in rectangular, circular, semi-circular or irregular paths.

Floor Maintenance System

G. H. TENNANT CO., Westfield, N. J., has developed the Tennant wood floor maintenance system which eliminates the necessity for soap and water scrubbing. This system is claimed to meet the highest standards of sanitation, making floors dry and vermin free underneath as well as on top. Warping and damage to wood resulting from the use of water is avoided, and the surface is said to be maintained in a permanently smooth and even condition.

This system is based on two principles: first, that wood will wear indefinitely if its fibers are bound and hardened, and its pores sealed against dirt, moisture and organisms that promotes decay; second, that a smooth, nonporous surface affords no lodgment for dirt and is easily cleaned.

In operation, the wood fibers are hardened and sealed by means of specially developed sealing or filling material spread over the floor and then burnished in by a high speed revolving roll of steel wool. This produces a smooth, non-porous surface that can be readily cleaned by sweeping with a cotton mop.

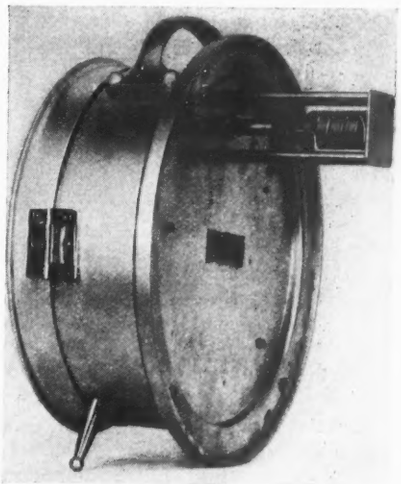
When the floors show dirt that cannot be removed by the mop, they are buffed with a steel wool roll or fiber brush, revolving at high speed. This restores the finish.

It is claimed that, in this way, even the floors of cake bakeries can be kept spotless, in spite of the raisins, batter, frosting, shortening and other materials spilled on them.

In operation, only one machine, with interchangeable drums is required.

Portable Recording Thermometer

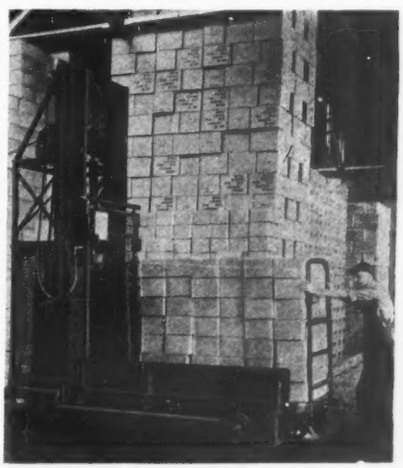
THE BRISTOL CO., Waterbury, Conn., is making a portable recording thermometer for use in traveling baking ovens and similar equipment. It is designed to pass through the oven with the bread and it will give a continuous record of the temperature to which the bread is subjected.



Portable recording thermometer for traveling ovens

Carton Piler

SERVICE CASTER & TRUCK CO., Albion, Mich., has developed a portable elevator called the "Telescopic Trailer Lifter," for piling cartons or containers high under trusses or balconies. It comes in various capacities up to 10,000 lb. and in lifts up to 30 ft. In construction, special attention has been given to strength, safety and handling ease.



Elevator for piling cartons and containers

Just Off The Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

ACIDPROOF PIPE JOINTS — Bulletin 902, United States Stoneware Co., Akron, Ohio, describes the Flexlock rubber joint for use with acidproof stoneware piping.

AIR CONDITIONING, REFRIGERATION AND UNIT HEATING—A wide range of equipment for use in business and industrial buildings is briefly described and specified in Bulletin C.E.-100 issued by Carrier Corp., Syracuse, N. Y.

AGITATOR DRIVES—Foote Bros. Gear & Machine Corp., 5301 S. Western Blvd., Chicago, Ill., in Bulletin No. 601, gives ratings, specifications, dimensions and descriptions of "IXL Type AD" vertical agitator drives.

BUCKET ELEVATORS—Standard bucket elevators, with their parts and accessories, are specified and described in a 56-page catalog published by Sprout, Waldron & Co., Muncy, Pa.

CAN AND BOTTLE WASHERS—A full line of power-washing machinery for milk cans and bottles is the subject of a series of bulletins gathered in a loose-leaf binder by Rice & Adams Corp., Buffalo, N. Y.

COLLOID MILLS—Liquid type and paste type colloid mill for grinding, emulsifying and other processes are discussed with illustrations, specifications and application data in a 24-page bulletin of Premier Mills Corp., Geneva, N. Y.

GRINDING—Closed circuit grinding with mechanical air separation as used on such products as soybean meal and cottonseed meal, is described in Bulletin No. 31, Raymond Pulverizer Division, Combustion Engineering Co., 1315 N. Branch St., Chicago, Ill.

HEATERS—Heaters and heat exchangers of tubular types for use in breweries, dairies, sugar refineries and other food plants are described with specifications in Bulletin 200, an illustrated catalog of Alberger Heater Co., 281 Chicago St., Buffalo, N. Y.

MATERIALS HANDLING EQUIPMENT —In Catalog No. 20, a 52-page illustrated bulletin, Lewis-Shepard Co., Watertown, Boston, Mass., describes a complete line of factory trucks and accessory materials handling equipment.

MATERIALS HANDLING EQUIPMENT —In Bulletin No. 80, C. O. Bartlett & Snow Co., Cleveland, Ohio, has issued a 24-page bulletin illustrating and describing a line of Timken bearing equipped belt idlers for belt conveyors.

MIXERS—Portable mixers for plant and laboratory are illustrated and described in Bulletins B-61-19M and B-55-25M of Mixing Equipment Co., 1026 Garson Ave., Rochester, N. Y.

MIXERS—"Reco" food mixer of the vertical bowl type, 12 and 22 qt. sizes, are described in a 4-page illustrated bulletin, No. 618, of Reynolds Electric Co., 2650 W. Congress St., Chicago, Ill.

ROTARY DRYER—Applications of the "Roto-Louvre" dryer on food and other materials are listed, together with a description of the apparatus in folder No. 1511, published by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

WATER FILTERS—The Norwood Pressure Filters for use in the purification of water for beverage and other food plants is the subject of an 8-page bulletin of Norwood Filtration Co., Florence, Mass.

Plant Accessories and Supplies

COMPRESSORS AND VACUUM PUMPS —Bulletin No. 2118, Ingersoll-Rand Co., Phillipsburg, Pa., describes small industrial compressors and vacuum pumps, ranging in size from ¼ to 15 hp.

DIESEL ELECTRIC GENERATORS—In booklet C85, Caterpillar Tractor Co., Peoria, Ill., illustrates and describes industrial and other applications of diesel powered electric generator sets.

ELECTRICAL EQUIPMENT—General Electric Co., Schenectady, N. Y. has recently issued the following new bulletins: GEA-2635, dealing with electrical recording instruments; GEA-2011A, describing the AP-9 medium-sized portable electric instruments for inspection and checking purposes; GEA-1587C, describing the combination magnetic switch; GEA-7008 for full voltage starting of induction motors; GEA-2473, describing push-button stations for use in the control circuits of magnetic controllers.

FACTORY LIGHTING—Complete information concerning the use of electric light in the factory and for other applications is contained in a 258-page reference book entitled "Artificial Light and Its Applications," published by the Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa., at 75 cents per copy.

PACKING GLANDS—"John Crane" conical self-aligning packing glands for use with air and refrigerating compressors are described in a 4-page illustrated bulletin of Crane Packing Co., 1800 Cuyler Ave., Chicago, Ill.

SCOOPS AND SHOVELS—Light-weight, acid-resisting, non-corroding, and non-sparking scoops and shovels of aluminum alloy are described in a recent illustrated bulletin of the Wood Shovel & Tool Co., Piqua, Ohio.

STAINLESS STEEL FITTINGS—Wallace fabricated stainless steel tube fittings are described with specifications in a 4-page illustrated bulletin issued by Pittsburgh Stainless Steel Fittings Co., 7501 Thomas Blvd., Pittsburgh, Pa.

Trucks, Tractors and Accessories

BAKERY DELIVERY TRUCKS—A recent folder of General Motors Truck Co., Detroit, Mich., illustrates trucks especially designed for the delivery of bakery products.

TRAILERS—The salient feature of Fruehauf trailers are shown by picture and text in Bulletin 351137 of Fruehauf Trailer Co., Detroit, Mich.

TRAILERS—Trailer bodies for food haulage and other purposes are illustrated, together with specifications, in two recent bulletins of Highway Trailer Co., Edgerton, Wis., describing the "Freightmaster" and "Roadmaster."

TRUCK LUBRICATION—Extreme pressure lubricants for heavy duty trucks are discussed by Four-Wheel-Drive Auto Co., Clintonville, Wis., in an 8-page illustrated booklet.

Materials of Construction

INSULATION — Corkboard insulation for cold storage rooms and cork covering for cold piping form the subject of two new illustrated bulletins of Armstrong Cork Products Co., Lancaster, Pa.

General News—Business Trends—Men, Jobs and Companies

Confectioners Discuss Operating Problems

Practical problems pertaining to the manufacture and distribution of confectionary products were discussed at the annual convention of National Confectioners' Association in New York the week of June 6. And an exposition consisting of a record number of equipment and supply displays supplemented the educational sessions with the result of attracting the largest crowd ever to attend the annual meeting of this association.

The "covered wagon days" are gone insofar as candy marketing is concerned, the confectioners were told by C. E. Birgfeld, assistant chief, Foodstuffs Division, Bureau of Foreign and Domestic Commerce. There are no longer wide open market spaces merely awaiting to be tapped without fear of competition or without consideration for one's fellow manufacturer, he said. Candy has a new frontier in the problem of cooperative market developments and presents a challenge to the confectionery industry to solve its common problems through common action, Mr. Birgfeld said.

A very practical paper on air-conditioning the confectionary plant was presented by A. E. Stacey, consulting engineer, Buensod & Stacey, New York. Among much other information, Mr. Stacey presented a table of the temperatures, relative humidities and dewpoints that should be maintained in the various departments of the candy factory. The table follows:

Department	*Dry Bulb Temperature 'F.*	*Relative Humidity %*	*Dew-Point 'F.*
Nut Storage.....	30–32	75–80	25–26
Chocolate Bar Cooling	45	80	37
Chcolate Bar Discharge Room.....	65	45	43
Hand Dipping Room..	60	50	42
Enrobing Cooling Room	60	50	42
Hard Candy.....	75	35–45	45–52
Candy Storage.....	65	65	57
Starch Room—Cream Centers Cane.....	80	50	64
Starch Room—Cream Centers High Glucose	75	50	55
Gum Work Drying...	120–140		

A summary of a fair trade act survey, conducted by NCA was given by M. F. Burger, secretary of the association. Mr. Burger reported that out of 84 questionnaires returned, 75 reported that they did not operate under retail price maintenance contracts. Nine reported that they did operate under contracts.

HEADS NCA

Harry R. Chapman, vice-president of New England Confectionery Co., Cambridge, Mass., was elected president of National Confectioners Association at the recent annual convention.

Dr. Walter H. Eddy, professor at Columbia University, made the suggestion that more accurate, more intensive and more widespread educational propaganda should be issued by the candy industry on the subject of candy as a food. The saturation point in candy sales has by no means been reached, he said. Many people can eat more of it to their advantage.

Rice Millers Meet

Experiments in canning cooked rice so that it will be ready to serve on short notice were reported at the annual convention of Rice Millers' Association in Galveston, Tex., at the close of May. However, another year is expected to elapse before research along this line is completed. It was also reported at the meeting that experiments with rice straw and hulls in by-product utilization are under way.

W. M. Reid, executive secretary of the association, reported that current rice distribution is 20 per cent above last year, due to increased exports to Cuba and to purchases made by the Federal Surplus Commodity Corporation.

Food and Drug Bill Passed by Congress

Speedy approval by President Roosevelt was expected when the much amended food, drug and cosmetics Bill (S.5) of Senator Copeland was accepted in its final form by the Senate and House, June 10 and 11, and forwarded to the White House, after five years of litigation. Industry in general approves the measure in its present shape.

The closing stages of the legislation saw the hottest fight centered on Sec. 701 f. That section originally provided for review of orders issued by the Food and Drug Administration, by any of the Federal district courts. This raised the opposition of the Food and Drug Administration, which has had some bitter experience in the courts.

As the measure was finally amended in conference, that provision was altered to provide for appeal, within 90 days, to the U.S. Court of Appeals in the home district of the appellant, and judicial review of the order. Summons in such appeals may be served anywhere in the United States, and the bill authorizes appellants to produce new evidence, upon their showing of reasonable grounds for such action.

The amended section also authorizes the U.S. Courts to set aside the order in whole or in part, either temporarily or permanently, and extends the court's authority over sins of omission as well as of commission. It makes the court order final and subject to review only by the U.S. Supreme Court.

In approving the conference report Congress accepted a number of important alterations on the seizure section (Sec. 304 a) of the bill. New language had been substituted for the original, in the case of the phrase "false or fraudulent."

The final draft reads: that when the labeling of the misbranded article is "fraudulent, or would be in a material respect misleading to the injury or damage of the purchaser or consumer." This change was made largely because of the contention of the F&DA, which has had trouble at times in proving fraud.

Section 402 d, dealing with adulterated foods, was amended by the elimination of the words "or ice cream" in two different places in the section. The section is altered to eliminate the words "harmless stabilizer of animal or vege-

table origin." The words "harmless resinous glaze not in excess of four tenths of one per centum," were substituted.

Further amendment of that section eliminated the last sentence which provided that the section would not apply to proprietary foods, the ingredients of which had been revealed to the Secretary. This means there are no exceptions to the requirements of full disclosure of contents.

Among the other important changes in the House draft of the Bill made by the committee was the alteration of Sec. 402 f. This took from the Secretary of Agriculture power to issue regulations under the warning clause of the bill.

Macaroni Men Meet

Continuation of the program outlined for the industry a year ago was the decision of the National Macaroni Manufacturers Association in its 35th annual convention held in Chicago, June 20 and 21.

Resolutions were made to continue the services of the paid full-time president, Lester S. Dame, who took up his duties Nov. 1st and to make membership in the association within reach of every company in the industry.

Organization and functional activities of the association were made available to all members of the industry through the grouping of 48 states into 8 regional areas each represented by at least one regional director with the New York and Philadelphia area group having three directors and the Chicago area group having two. The 48 states as a whole are represented by four directors-at-large.

Macaroni Trade Rules Tentatively Approved

Fair trade practice rules for the macaroni, noodles and related products industry have been tentatively approved by the Federal Trade Commission. And the Commission held an open hearing in Washington on June 15 to give members of the industry an opportunity to express their opinions on the proposed regulations.

The regulations include fifteen rules. These rules (1) prohibit the misrepresentation of industry products; (2) give specifications for macaroni and noodle products; prohibit: (3) the improper use of the words "macaroni," "spaghetti," "vermicelli," "egg macaroni," "noodles," "egg noodles," "plain noodles," etc.; (4) misrepresentation of semolina or farina products; (5) misrepresentation as to egg content of the product; (6) use of deceptive coloring or deceptive containers; (7) deception as to additional food ingredients; (8) the use of deceptive illustrations; (9) defamation of competitors and discouragement of their products; (10) failure to brand products properly; (11) selling below cost; (12) imitation or simulation of trade-marks; (13) publication or circulation of false or misleading price quotations; (14) false invoicing; (15) acts in violation of the Robinson-Patman Act.

CONVENTIONS

July

12–14—National Confectionery Salesmen's Association of America, Pittsburgh, Pa.

August

17–20—National Food Distributors' Association, Hotel Cleveland, Cleveland.

30–Sept. 1—Society of American Bacteriologists, St. Francis Hotel, San Francisco.

Penn. State College Holds Food Conference

An eminently practical conference on food preservation was held at Pennsylvania State College, June 21-23, with the American Society of Refrigerating Engineers cooperating. Everyday problems in the dairy, poultry, butter and egg, cold storage, quick-freezing and ice cream fields were discussed by authorities in each line.

The attendance, totaling around 200, showed great interest in the papers. Prolonged discussion was aroused by the paper by A. A. Geiger, York Ice Machinery Corp., on "Farmers' Coolers and Lockers." It was brought out that the largest current use of these

CAPITAL VIEWS

FOOD LAW—Skillful compromising of the legal features involved in enforcement finally permitted enactment by Congress of the food and drug law. There are plenty of new teeth to bite chronic or careless offenders, but there is reasonable assurance that cooperative firms sincerely seeking to conform with the law will have no unusual difficulties. The fact that overzealous officials and over-timid industrialists both still fret is taken in Washington as good evidence that this is a first-class law.

SHRIMP INSPECTION—Revised regulations provide slightly modified procedure for Federal inspection of canned shrimp, effective July 1. Backers desiring renewal of previous inspection services will pay a little more and require a few more detailed facilities and reports. Others seeking this service must make application promptly.

STOP STREAM POLLUTION—As finally passed by Congress, the law limiting stream pollution is essentially the original House bill. In a few particulars the more vigorous Senate language was used. But essentially the law provides for scientific studies and for Federal cooperation with local governments and industries in cleaning up the waterways of the country. Perhaps the most important stimulus to early action will be funds for grants and loans to municipalities, states, and private parties seeking to correct present causes of pollution. Cooperative food managements will be aided by better water supplies. Careless dumping of polluting wastes is likely to result in sharp criticism of negligent managements, perhaps worse.

PRICE CUTTING—New Dealers now argue that business is negligent of its public responsibilities if it does not cut prices to stimulate more purchases. Apparently, the reformers who so argue do not think profits are of any consequence. Meantime agricultural relief efforts which involve price-pegging loans approach dangerously close to government price fixing for wheat, corn and cotton. It continues to be the objective of the New Deal to keep raw-materials prices high and market-basket prices low.

PROCESSING TAXES—Business benefits expected from the new tax law were largely destroyed by the President's attitude in allowing this measure to become effective without his approval. He threatens reestablishment of objectionabl forms of undistributed profit taxes next year, and will carry through this threat if fall elections continue New Deal control of Congress. Processing taxes on major agricultural materials also seem inevitable next year.

FOOD SURPLUSES—Wheat-crop prospects continue to increase official worry regarding carryover from 1938. The indicated record crop from 80 million acres would, under the farm control law, have been cut nearly in half for next year if Congress in a last-minute panic had not forbidden cuts below 55 million acres for the 1939 crop. Surplus purchases for distribution to undernourished make conspicuous newspaper politics, but little impression on granary surpluses. Far more comforting is the drought effect in Central Europe, which promises a new market for the excesses in the United States and Canada. Incidentally, German food shortages again lessen the prospect of a major war on the Continent.

FOOD PURCHASES—Washington is making a sincere effort to have surplus food purchases take the form of partly manufactured products, flour instead of wheat, for example. Thus, food processers have a fair chance for sharing in volume benefits, though low or zero profit margins may be demanded in order to stretch limited dollars to maximum relief benefit. Details of the purchasing plan are still under discussion and would be usefully modified by industry representations to Department of Agriculture.

MONOPOLY STUDY—Departments, not Congress, will dominate summer investigation of monopolistic practices. This is certain because the White House will decide major distribution of a half-million dollar fund. Much headline seeking for election-day influence can be expected. But even despite this, the results will have an important bearing on legislation to be expected next winter. Meantime the dairy products industry is likely to be a major goat in criminal and civil prosecutions under the present laws.

lockers is in upper income group urban areas. These freezer lockers were said to be a definite threat to present forms of retail meat distribution, as the estimated saving to the consumer is 10¢ per lb. of meat. Locker concerns are reported as buying frozen fruits and vegetables at wholesale and retailing them to locker renters, indicating another threat to established channels of distribution by charging only moderate brokerage for buying services.

Agree on Pollution Bill

After a deadlock lasting nearly a year, the conference committee on the stream pollution bill on June 7 reached an agreement on a measure setting up in the Public Health Service a division of water-pollution control. But the conference committee denied this body the authority to enforce its orders. The committee retained, however, the provisions for federal loans and grants to aid in the construction of purification works.

Proponents of a pollution bill with teeth in it are understood to have yielded on the understanding that the effectiveness of advisory findings will be tried out. If experience proves that pollution conditions cannot be remedied by the comparatively weak measure approved, additional legislation will be introduced.

AACC PRESIDENT
F. W. Geddes, Board of Grain Commissioners for Canada.

Wage-Hour Bill Passed

Before Congress adjourned in mid-June, both Houses passed the compromise wage and hour bill reported by the conference committee. The compromise measure is considered somewhat of an improvement over either the Senate or the House bill. Under it, the President appoints an administrator who is guided by recommendations of industry committees which are composed of an equal number of representatives of workers, employers and the general public for each industry. The administrator has the power of veto over the recommendations of the committee.

The minimum wages during the first year from effective date of the bill are placed at not less than 25 cents an hour. During the next six years, the wage will be not less than 30 cents an hour. After seven years, it is to be 40 cents.

The maximum hours are placed at 44 for a work-week during the first year, and 42 during the second year. This drops to 40 in the third year.

The other outstanding provision is the prevention of employment of child labor.

Exemption from the minimum wages and maximum hour provisions of the bill are granted "to any individual employed within the area of production (as defined by the administrator), engaged in handling, packing, storing, ginning, compressing, pasteurizing, drying, preparing in the raw or natural state, or canning of agricultural or horicultural commodities for market, or in making cheese or butter."

CONCENTRATES

• Federal Surplus Commodities Corp., acting under orders of Secretary Wallace, is carrying out a program for increasing purchases of food products for distribution to persons on relief. As of July 1, the FSCC had available an added $75,000,000. The purchase of 125,000 bbl. of surplus flour was authorized recently . . . According to Secretary Roper, the $6,500,000 fishways installed at Bonneville Dam are working well. Official counts by the Bureau of Fisheries when the advance guard of the first large salmon run reached the dam showed a total of 2,000 Columbia salmon using the fishways May 9 and nearly 3,000 the following day.

• *Forty-five bakeries in Seattle were closed early in June by a Strike. The workers asked pay increases of $2 a week for day workers and $1 for night men . . . National Labor Relations Board on June 2 certified Salt Workers union, a CIO group, as the exclusive representative of more than 300 production and maintenance employees of General Foods Corp. at the St. Clair, Mich., plant of its Diamond Crystal Salt Division . . . NLRB on June 3 ordered National Licorice Co. to disestablish the Collective Bargaining Committee of National Licorice Co. as employee representatives at its Brooklyn, N. Y., plant.*

• NLRB on June 7 certified United Packing House Workers Local Industrial Union as exclusive representative of the workers of Armour & Co. at Sioux City, Iowa . . . General Foods Sales Co., Inc., put into effect on June 27 minimum price contracts with retailers in Ohio. Minimum prices were set on four products: Jell-O, Post Toasties, Maxwell House Coffee and Swansdown Cake Flour. This step was undertaken as an experiment . . . In an order signed June 1, Secretary Wallace declared Swift & Co. to be guilty of violations of the Packers and Stockyards Act. The company is ordered to cease and desist from denying to the purchaser any discount which is granted to any other purchaser of similar quality and quantities.

• *The next annual convention of National Canners' Association will be held in Chicago, Jan. 22-27 . . . Simplified practice recommendation R146-38 covering corrugated and solid fiber boxes for canned fruits and vegetables has been issued by National Bureau of Standards . . . A drive will be started to control, through taxes or quotas, imports of edible oils, it has been declared by Tom J. Kidd, newly elected president of National Cottonseed Products Association. The association also hopes to effect reduction of the taxes on oleomargarine . . . Corn oil is now being extracted from refuse corn mash from distilleries, it was reported at the meeting of American Oil Chemists Society in New Orleans. This mash formerly was dried and sold as stock feed.*

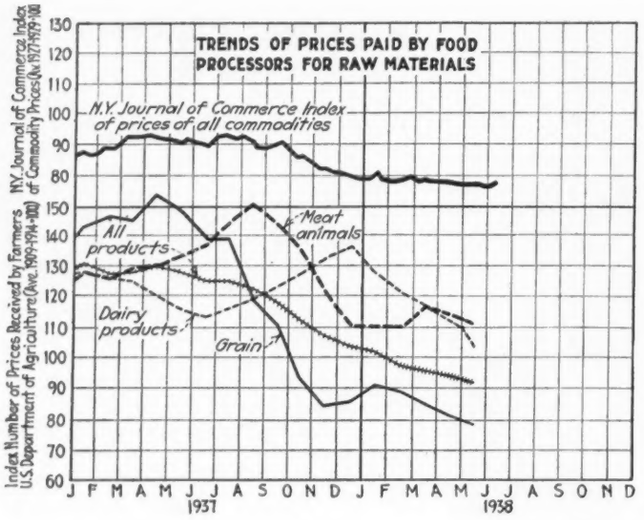
Cereal Chemists Hold Cincinnati Meeting

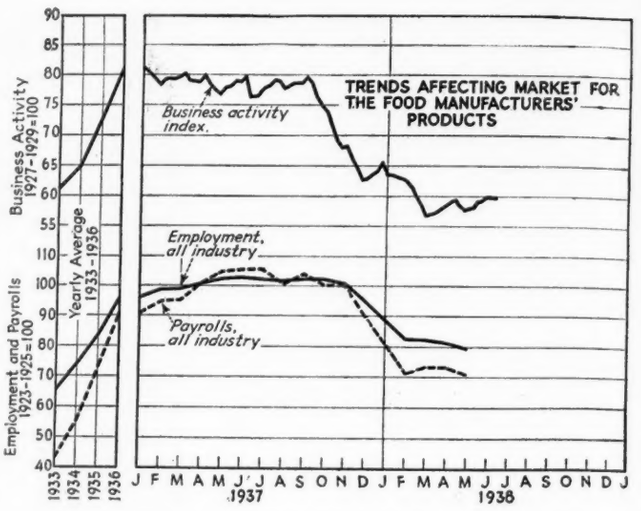
With a program devoted to activities in baking, malting and brewing, soft wheat milling, macaroni making, research and laboratory technic, the 24th annual meeting of American Association of Cereal Chemists was held in Cincinnati, May 23–27. Interest in the diversified program was evidenced by the record registration of 216 members.

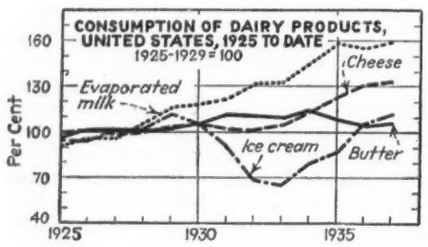
A total of 72 technical papers were read to comprise a soft-wheat symposium, a malting and brewing session and reports on individual research and committee studies of laboratory methods and problems.

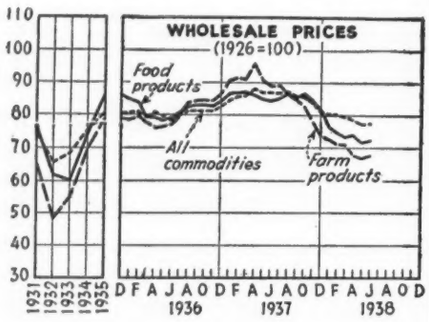
As a matter of review of progress made, H. G. Knight, U.S. Bureau of Chemistry and Soils, addressed the meeting on "Research in Cereal Industry," whereas L. E. Caster, president, Kreig Stevens Bakery, Rockford, Ill., representing American Society of Bakery Engineers, outlined to the group how cereal chemists can best be of help to production men.

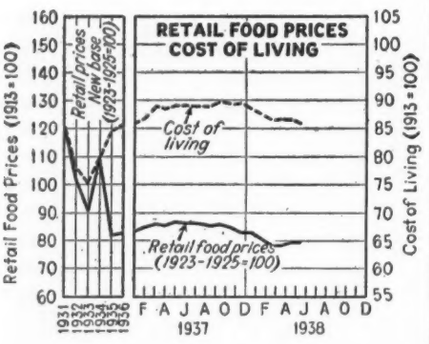
Kansas City, Mo., was chosen as the 1939 meeting place. F. W. Geddes, director of the grain research laboratory, Board of Grain Commissioners for Canada, Winnipeg, was elected president.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
All products
Meat animals
Dairy products
Grain
Index Number of Prices Received by Farmers, U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Ave. 1927-1929=100)
1931
1938









Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *Business Week*. The cost of living index is from the National Industrial Conference Board. The data on per capita consumption of dairy products is from the United States Department of Agriculture.

BUSINESS TRENDS

General Prices And Food Prices Stagnate

Commodity prices in general upped slightly during the month from mid-May to mid-June. The movement was too slight, however, to mark anything like a definite trend. The *N. Y. Journal of Commerce's* general index, which stood at 77.6 on May 14, fell to 76.9 on May 28, then turned upward to 77.0 on June 4 and reached 77.9 on June 11. On June 18, however, this index was back at 77.0.

Business activity kept step with the movement in commodity prices, as indicated by the Business Week's index, which stood at 58.3 on May 14 and at 59.4 on June 11.

Individual food commodity prices did not register any startling changes during the four weeks period. Wheat, flour, and pork shoulders increased slightly, while pork loins, lamb, lard, butter, eggs and cheese fell off slightly. Beef and cottonseed oil were steady.

More Hog Supplies

A favorable corn-hog ratio has encouraged hog production ever since the 1937 corn crop became available. This situation, while not yet greatly apparent in supplies of animals for slaughter, is likely soon to have considerable affect on both supplies of pork and lard.

Storage stocks of pork and lard are fairly low at the present time, and the early summer slaughter, while it will show an increase, will not reach unusual heights. Hence, the price of hog products will probably be firm over the summer, with some increase possible in the late summer, when seasonal reduction in hog slaughter occurs.

After the corn harvest, however, the new crop year promises considerable increase. This year's spring pig crop showed an increase over the 1937 spring production and, if the coming corn crop is ample, a considerable increase in the 1938 fall pig crop can be expected. This should result in greater pig marketings in the 1938-39 crop year, beginning next October.

Heavy Wheat Yield Still in Prospect

In spite of alarms, real and fancied, a heavy wheat yield is still to be expected. Reports of rust and other damage in the Southwest have been in part confirmed. Yet the U.S. Department of Agriculture June 1 estimate, issued on June 10, forecast a winter wheat yield of some 760,000,000 bu. Add to this a spring wheat yield of something over 200,000,000 bu. and the total crop will come close to a billion bushels. Only twice in history has this figure been exceeded.

Naturally, faced with a wheat crop that will provide at least 300,000,000 bu. more than domestic needs, and with considerable carryover from the 1937 crop still available, wheat prices fell off. However, in the first part of June, traders became so greatly alarmed over crop damage reports from Oklahoma and adjacent areas, that prices started upward again. This trend was sufficiently strong to more than wipe out all the losses of the latter part of May, so that wheat which stood at 81½ cents on May 15 had moved to 85¾ cents on June 15.

Already the harvest is well under way and should be completed not long after July 1. Conservative estimation of the results of this harvest is that, while

damage to the crop is considerable, it will not be nearly as great as some traders now anticipate. Reports from Texas and Oklahoma both indicate that early shipments are mostly No. 2 or better, so that the damage was not greatly apparent at the time these words were written.

Oleomargarine Output At Record Levels

Oleomargarine production in the first three months of 1938 was 14.9 per cent above the output for the first quarter of 1937. In March, 1938, production was 33.6 per cent over the figure for March, 1937. In April, however, production of margarine fell 2.6 per cent below the April, 1937, figure.

For the first four months of this year the production of margarine totaled 148,372,695 lb., compared to 130,341,628 lb. in the same period a year ago. This increase was 13.8 per cent.

It will be noted that each of the first three months of this year showed a greater production of oleomargarine than the corresponding months of 1937, while the April output decreased. These figures correspond closely with the level of butter prices, which were held at high levels, relative to the general level of food commodity prices, during the first quarter, but decreased in April.

Butter output in April, this year, was 146,791,000 lb., compared to 132,107,000 lb. in April, 1937. In the first four months of 1938, butter production was 498,836,000 lb., an increase of 8.4 per cent over the 1937 production for the same period.

However, on June 1, 1938, butter in storage totaled 54,408,000 lb., compared to 22,904,000 lb. on June 1, 1937, and a 1933-37 average for June 1 of 27,895,000 lb. The May 1, 1938 storage total was 19,574.000 lb. Apparently, more than 34,000,000 lb. of butter went into storage in May, in spite of reduced butter prices and reduced output of margarine.

It would seem, from these figures, that there is, at least in periods of reduced consumer purchasing power, a fairly definite ceiling for butter prices, beyond which consumption falls off, with competitive products benefiting by part of the reduced butter demand.

Construction News

	Pending (thousands)	Awarded June (thousands)	Total Awarded 1938 (thousands)
Bakery	$80	$83	$558
Beverages	195	141	2,387
Canning and Preserving	215	85	240
Confectionery	40	.....	.....
Grain Mill Products	105	130	360
Ice Manufactured	100	.....	260
Meats and Meat Products	730	65	1,513
Milk Products	200	122	557
Miscellaneous	200	325	3,904
	$1,865	$951	$9,779

Canned Pea Prospects

Preliminary estimates of acreage planted this year to peas for canning and freezing shows a total of 325,710 acres, according to figures of the Bureau of Agricultural Economics. Allowing for the average annual abandonment of 9 per cent, there would be 296,400 acres for harvest. This compares to 334,820 acres harvested in 1937 and a 1927-1936 average of 236,040 acres.

As to condition, the Bureau reported condition on June 1, 1938, as 84.9 per cent. Last year, on June 1, condition was 87.3 per cent, while the 1927-36 average for the date was 81.8 per cent.

Evidently, allowing for favorable weather until harvest is completed, the prospects for a crop of canned and frozen peas is not as bad as had at first been reported. While last year's high yield will not be reached, it is apparent that the output is likely to be well above the ten year average.

Business Moves Timidly Upward

For the period ending with the third week in June, slight gains were registered by most of the important business indexes and indicators.. The movement was not very great, and it had not been active long enough to mark a definite upward trend. But, in spite of these facts, it was sufficiently encouraging to cause an upturn in the prices of both stock and speculative commodities.

Moody's index, which stood at 137.2 on May 21, dipped to 133 on June 11 and then recovered to 136 on June 18. Fisher's index was 81 on June 18, compared to 80.5 two weeks earlier and 81.4 on May 21. *The Business Weeks'* index of business activity rose 3.94% to 60.6 in five weeks ending June 18.

Automobile production, which hit a low of 26,980 over the Memorial Day holiday, recovered to 41,790 for the week ending June 18. Steel, at 26.1 per cent of capacity in the week of May 30, rose to 28 per cent in the week of June 13. Electric power production and building also rose, although heavy engineering awards fell.

The United States Department of Labor indexes of wholesale prices for the five weeks ending June 18 showed 0.77 gain for the general index, 3.41 per cent gain for the farm index and 2.79 per cent rise for the food index. The weekly weighted commodity price indexes of the *New York Journal of Commerce* in the five weeks ending June 25, fell 1.42 per cent for the general index, dropped 1.19 per cent for the grain index and showed no change for the food index.

INDICATORS

CHEESE PRODUCTION, April, 1938, is reported by the U.S. Department of Agriculture at 44,451,000 lb., up 18.7 per cent from the 37,150,000 lb. reported for April, 1937.

EVAPORATED MILK PRODUCTION, April, 1938, is estimated to have been 198,203,000 lb., compared to 177,649,000 lb. in April, 1937, an increase of 11.5 per cent.

FLOUR PRODUCTION, for mills representing about 60 per cent of U.S. output, is reported by *Northwestern Miller* to have been 4,979,372 bbl. in May, 1938, compared to 5,066,017 a year before.

SALES OF CONFECTIONERY and competitive chocolate products, first four months of 1938, were $78,638,748, off 8 per cent from sales of these products in the corresponding months of 1937.

FISHERY PRODUCTS in cold storage in the United States on April 15, 1938, were 36,056,000 lb., compared to 42,957,000 lb. on April 15, 1937, and a five-year average for the date of 25,255,000 lb., according to the Bureau of Fisheries.

FROZEN FRUITS in storage, June 1, 1938, totaled 90,307,000 lb., compared to 48,788,000 lb. on June 1, 1937, and a 1933-37 average for the date of 51,032,000 lb.

FROZEN VEGETABLES in storage, June 1, 1938, amounted to 21,392,000 lb., compared to 6,260,000 lb. on June 1, 1937.

BUTTER, creamery, in storage on June 1, this year, was 54,408,000 lb. This compares to 22,904,000 lb. on the same date last year and a 1933-37 average of 27,895,000 lb.

CHEESE in storage on the first of June this year totaled 91,131,000 lb., compared to 85,008,000 lb. on June 1, 1937, and a 1933-37 June 1 average of 66,502,000 lb.

EGGS in storage, case equivalent, June 1, 1938, were 8,829,000 cases, compared to 11,104,000 cases on June 1, 1937, and a 1933-37 average for June 1 of 9,857,000 lb.

POULTRY, frozen, in storage on June 1, 1938, totaled 52,023,000 lb., all kinds. The figure on the same date last year was 82,340,000 lb., and the 1933-37 average for the date was 50,091,000 lb.

MEAT, all kinds, in cure and cold storage on June 1, this year, was 547,875,000 lb., compared to 835,424,000 lb. a year before and a 1933-37 June 1 average of 700,976,000 lb.

LARD in storage on June 1, 1938, totaled 123,736,000 lb., compared to 194,477,000 lb. on June 1, 1937, and a 1933-37 average for the date of 135,450,000 lb.

WEEKLY FOOD INDEX, Dun & Bradstreet, was $2.37 on June 14. This was a rise of 3 cents from the low of two weeks previous.

MEN, JOBS and COMPANIES

INDUSTRY

» BRASS YEAST CORP. formally opened its new plant at Newark, N. J., June 3. Modernistic in design, the plant is highly mechanized and includes an extensive laboratory for the development of yeast foods. The factory measures 250x180 ft. and is two stories high. The company, headed by Samuel Brass, will operate a fleet of 25 delivery trucks.

» COCA-COLA BOTTLING CO. will build a new $150,000 plant at Toledo.

» CONTINENTAL GRAIN CO., Chicago, recently acquired the properties of Commonwealth Flour Mills, Inc., St. Louis. Continental will utilize only the acquired company's elevators and will dismantle the milling plant, a 3,000-bbl. unit which has been idle for some time.

» FROZEN FOODS STORAGE CO. has been formed at Crawfordsville, Ind., with capital stock of $50,000.

» GENERAL FOODS CORP. began construction on June 6 of what will be the world's largest coffee plant. The plant will be on the North River waterfront in Hoboken, N. J. Six structures providing 500,000 sq.ft. of floor area will be completed by fall at a cost of more than $1,000,000.

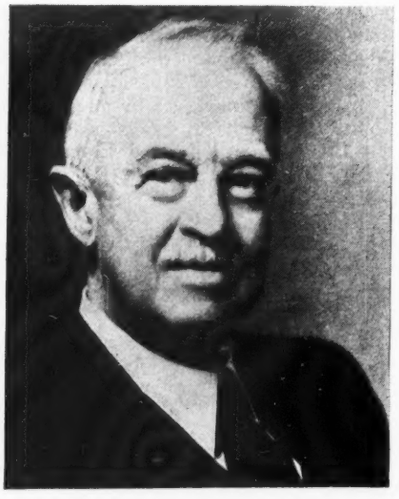
» GENERAL MILLS, INC., has formed with Eastman Kodak Co. a jointly owned corporation to produce concentrated vitamin products. Known as Distillation Products, Inc., the new corporation will exploit inventions, products, processes and machinery in the field of molecular distillation. The distribution of vitamin A and D products produced by the company will be handled through the American Research Products division of General Mills, Inc. James F. Bell, chairman of the board of General Mills, will be board chairman of the new company. The president is Frank W. Lovejoy, president and general manager of Eastman Kodak Co. Active direction of research and production will be in charge of Dr. Kenneth Hickman, who has been research chemist of Eastman Kodak Co. The headquarters are in Rochester, N. Y.

» GROCERS BAKING CO., Louisville, which recently purchased Prinz Baking Co., Owensboro, Ky., will build a $200,000 plant at Owensboro.

» JONES PIE BAKING CO. will construct this summer a model plant located on State Highway 29 at Hillside, N. J. To have 25,000 sq.ft. of floor space, the plant will have double the capacity of the company's present factory, which will be closed.

WILLIAM F. REDFIELD

He has been made president and general manager of Hills Bros. Co., New York. Lucius R. Eastman, formerly president, has become chairman of the board. J. M. Hills was named vice-president and treasurer.



ALVA CUDDEBACK

One year ago, at the age of 73, he retired as vice-president of Sheffield Farms Co., Inc., terminating 50 years in the dairy industry. On May 31 he went with Horton Pilsener Brewing Co., New York, as president. Mr. Cuddeback fills a vacancy caused by the recent death of John A. Weisenfluh.

» F. L. KLEIN NOODLE CO., Chicago, has taken over the Illinois O-Ke-Doke plant of Kraft-Phenix Cheese Corp. In addition to handling the cheese-flavored popcorn developed by Kraft-Phenix, the noodle company manufactures French-fried popcorn, packed in 5- and 10-cent transparent cellulose bags.

» KRAFT-PHENIX CHEESE CORP. has taken over all the business of Thompson Slater Products Co. in the Omaha territory.

» STANDARD BRANDS, INC., is building a large pickle plant at Texarkana, Ark. The plant, measuring 560x80 ft., will provide 45,000 sq.ft. of floor space and will have a capacity of 130,000 bu. of pickles.

» STOKELY BROS. & CO. will freeze shrimp at its Mercedes, Tex., plant. Stokely recently acquired the E. J. Balza Co. pickle and kraut plant at Green Bay, Wis.

» SWIFT & CO. is planning a $1,000,000 improvement and expansion program at its Vernon, Calif., meat packing plant. A new four-story building will be erected.

PERSONNEL

» EARLE I. BARKER, one of the head millers of General Mills, Inc., at Buffalo, retired May 15 after 34 years in that plant.

» JOHN BENKERT, New York, recently was chosen president of the New York State Association of Manufacturing Retail Bakers.

» CHARLES S. BOGEL, chief inspector of the Iowa Department of Agriculture, now heads up the North Central States Association of Dairy, Food and Drug Officials.

» RAYMOND N. BOSTOCK, formerly of the firm of consulting engineers of Rue & Bostock, Newark, N. J., has joined the engineering department of P. Ballantine & Sons, Newark brewers.

» DR. C. I. CORBIN has been made a vice-president of Sheffield Farms Co., Inc., New York. Dr. Corbin fills a vacancy caused by the retirement of Horace S. Tuthill.

» C. H. COX, Memphis, Tenn., recently was elected president of American Cotton Oil Chemists' Society.

» C. N. COULTER, formerly production manager of Runkel Bros., has entered the employ of Siren Mills Corp., Chicago, to work on special development problems.

» ERNEST D. FIEUX, formerly with Runkel Bros., recently became head of manufacturing and sales in the coatings and liquors department of Hershey (Pa.) Chocolate Co.

» ARNOLD GOOD, Thermopolis, succeeds

Jesse Taft as president of Wyoming Bakers' Association.

» H. W. INGERSOLL, JR., has been elected president of Ohio Dairy Products Association for the coming year. He is with Elyria Dairies, Inc.

» SAM V. JOHNSTON, formerly manager of the Eastern division of Stokely-Van Camp's, has been appointed sales manager of Stokely Bros. & Co., Indianapolis. Warren Tingdale, formerly assistant division manager of the Northwest division of Stokely-Van Camp's, was appointed sales manager of Van Camp's Inc. Lee Dingee, former president of Fame Canning Co., becomes sales manager of the private label and institutional department of Stokely-Van Camp's.

» ROBERT H. JENNINGS, JR., Orangeburg, S. C., has been named president of Southern Bakers' Association.

» DR. RALPH K. LARMOUR has been appointed professor of milling industry at Kansas State College, Manhattan, to fill the position vacated when Rowland J. Clark left to go with Shellabarger Mill & Elevator Co.

» K. A. MCLACHLIN, Loving, N. M., was elected president of National Oil Mill Superintendents Association at the annual convention on May 21.

» G. M. MCLEAN becomes general traffic manager of Central Soya Products, Inc., and Central Sugar Co., both of Decatur, Ind., and the McMillen Feed Co., Fort Wayne. Mr. McLean formerly was assistant general traffic manager of Allied Mills & Central Distributing Co.

» C. T. PETERS is now manager and packing house foreman for the Donna (Tex.) Citrus Association.

» A. C. RAMSDELL, Rockland, recently was elected president of Maine Sardine Packers' Association.

» R. S. ROBERTSON, Brownstown, Ind., has been re-elected president of Indiana State Millers' Association.

» C. E. ROBINSON has been appointed superintendent of the central division manufacturing department of General Mills, Inc. He is located in Chicago.

» E. V. SCHAPER, New Orleans, is the new president of Rice Millers' Association.

» THOMAS G. SPATES, director of industrial relations, General Foods Corp., New York, has been made a divisional vice-president of American Management Association. C. L. Stivers, office manager of Jewel Tea Co., Inc., Barrington, Ill., is also a divisional vice-president of the association.

» HORACE S. TUTHILL resigned recently as vice-president of Sheffield Farms Co., Inc., New York, after 50 years in the milk industry. He continues as a member of the board.

DEATHS

» FRANK W. BOUSKA, for many years a member of the research committee of American Butter Institute, Chicago, and a well-known authority on the dairy industry, recently.

» WILLIAM C. BUETHE, 64, vice-president and treasurer of Wilson & Co., Chicago, May 25.

» KENNETH J. BULLOCK, superintendent of Southern Dairies, Inc., May 22. He was drowned while on a fishing trip in Florida.

» ERNEST M. CHACE, 72, president of Mason Canning Co., Cincinnati, recently.

» ERNEST J. DOSSIN, 72, founder and president of Dossin's Food Products, Inc., Detroit, May 30.

» WILLIAM C. ESTERLINE, 70, former manager of the Cincinnati, Columbus and North Pittsburgh branches of H. J. Heinz Co., recently, in Los Angeles.

» THEODORE ITTNER, 63, cashier and assistant treasurer of Pet Milk Co., St. Louis, June 5.

» LEANDER V. GRIDLEY, 86, founder of the company which later developed into Gridley Dairy Co., Milwaukee, June 7, at Rockford, Ill.

» H. T. LANG, 80, president of Lang Canning Co., Eau Claire, Wis., June 3.

» DAVID LOWENSTEIN, 78, former head of A. Lowenstein & Sons Meat Packing Co., Cincinnati, recently.

» JOHN G. TIPPETT, 61, former president of International Products Co. and at one time associated with Sulzberger Packing Co., Swift & Co. and Vestey Packing Co., May 30 at Middletown, Del.

ASSOCIATED INDUSTRIES

» ACME STEEL CO. has appointed George P. Howell district manager of the strip-steel division for Wisconsin and upper Michigan.

» CREAMERY PACKAGE MFG. CO. announces that J. H. Godfrey resumed active charge of its advertising following the sudden death of B. R. Graff.

» MARLEY CO. has moved into a large new building in Kansas City, Kan. The company manufactures water-cooling equipment.

» A. C. NIELSEN CO. has placed James O. Peckham in charge of the New York office to replace W. B. Murphy, who has gone with Campbell Soup Co. as assistant to the president.

» PACKAGE MACHINERY CO., Springfield, Mass., is celebrating its 25th year. In this connection, it has issued a booklet reviewing progress in packaging. It is pointed out in this booklet that hundreds of products which have been introduced during the past 25 years could not possibly have been marketed in sufficient volume without the low cost made possible by machine wrapping.

FOOD TRANSPORT FOR SHUTTLE SERVICE

This tractor-trailer unit, together with two other trailers, comprises the shuttle "fleet" put into service by S. Gumpert Co., Brooklyn, N. Y. The rail siding is about ⅛ mile from the plant. In moving products or materials to or from the plant, one trailer is in transit while a second is being loaded and a third unloaded. The trailers also serve as effective traveling billboards, the company name being prominently lettered in blue and gold on a flashing white background. The trailers are 22 ft. long, 8 ft. wide and 6 ft. high.

New Discoveries

(*Continued from page 399*)

even commercial invert sugar as the fermentable substance. No differences of flavor, aroma or carbonation of finished dry champagne develop no matter which sugar is used. But if the champagne is sweet instead of dry, and the foregoing sugars are used for sweetening, there is a slight difference in flavor. Slight flatness is associated with dextrose. A combination of 60 per cent sucrose and 40 per cent dextrose behaved well, giving more body than is usually found in sweetened champagne.

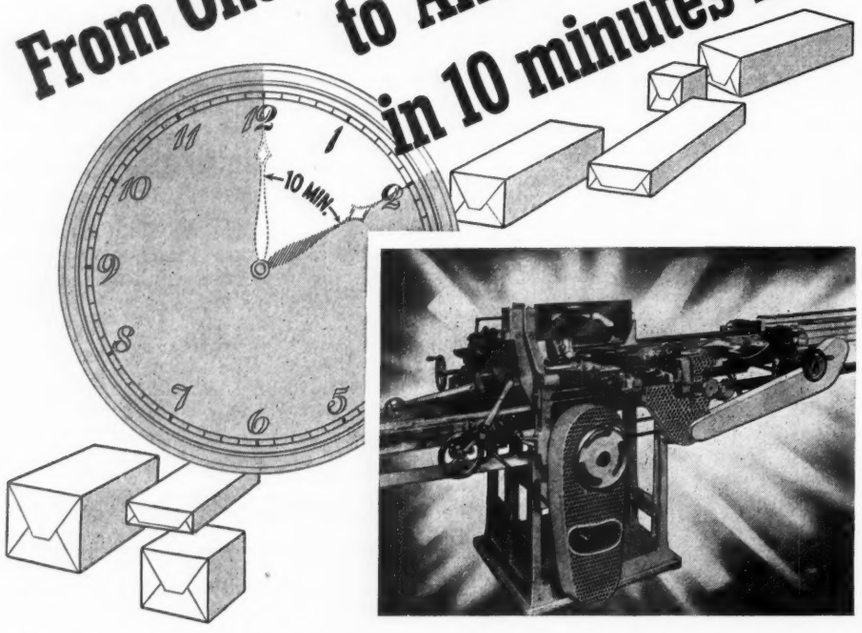
Digest from "Sugars in Champagne Production." By Goresline and Champlin. Industrial and Engineering Chemistry, 30, 112, 1938.

PICKLES

Why Pickles Become "Slippery"

IN SPOILED, i.e. slippery, pickles there is a twofold increase of soluble pectin over normal pickles, indicating that the bacteria, *B. mesentericus fuscus* produces protopectinase and possibly pectase, but not pectinase, within four days. In other words, the bacterial spoilage consists of conversion of insoluble protopectin into soluble pectin and possibly pectic acid by bacterial enzymes. This makes the pickles first slippery and finally mushy.

Digest from "Chemical Changes Produced in the Pectic Substances of Pickles by Bacterial Enzymes," by F. W. Fabian and E. A. Johnson. *Conference on Pickling*, Mich. State College, Feb. 23–25, 1938.



Here is a wrapping machine that has won remarkable popularity, considering its short time on the market. A new and important advantage of the Model FA-Q is the speed with which it can be adjusted for different sized packages. Moreover, it has an extremely wide size range.

A leading manufacturer, after conducting a test of the FA-Q's efficiency, recently ordered ten of these machines. Another manufacturer has installed five. Orders for one and two machines apiece are being received from numerous other manufacturers all over the country.

On the Model FA-Q, all adjustments are made by hand-wheels conveniently located . . no tools are required. Changes for all three package dimensions can be made in only 10 minutes.

The Model FA-Q has a speed of at least 40 to 70 packages per minute depending on the size and nature of the package. Can be equipped to handle any type of wrapping material. Electric Eye registration permits the use of printed wrapping material in the economical roll form . . . locates the printing accurately no matter how long the run.

Compare your present wrapping method with the advantages offered by the FA-Q. Consult our nearest office, or write for literature.

PACKAGE MACHINERY COMPANY **Springfield, Massachusetts**

NEW YORK CHICAGO CLEVELAND LOS ANGELES

Peterborough, England: Baker Perkins Ltd. Melbourne, Australia: Baker Perkins Pty., Ltd.
Mexico, D. F., Apartado 2303 Buenos Aires, Argentina: David H. Orton, Paipu 231

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

DAIRY PRODUCTS

Milk Temperature Transit Rise

IN THE SUMMER TIME, the temperature of two 40-qt. cans of milk rose at the rate of 10.5 and 9.3 deg. F. per hour during the first two hours. But where the can was covered by a regulation can-jacket the average temperature-rise was 3.8 deg. F. per hour. The initial temperature of the milk was 43 deg. F. Outside temperatures were roughly 90 deg. F. in the shade.

Digest from "The Warming of Milk in Transit," by John E. Nicholas. *Agricultural Engineering*, 61, Feb., 1938.

Pressed Curd Needs More Study

CLOSER ACCORD is needed between the dairies making pressed curd in the season of high milk yield, and the cheese makers whom they supply in the season of low milk yield. Dairies should know more of the preparation factors which influence the quality of the curd. And the cheese maker could guide his processes better if he knew the exact history of the curd. The bacteriology of curd making has received relatively less attention than that of cream and butter, but the factors in greatest need of study and attention are the colloidal and physicochemical influences.

Three very important factors are the swelling of the casein, gelation, and the subsequent syneresis which separates the liquid phase (serum) from the curd. Acidification (souring, natural or artificial) of the milk gives the initial swelling effect, followed by gelation. Gel strength is an important factor, influenced by temperature, acidity, thermal history of the milk (whether heated rapidly or slowly, and to what temperature), and composition.

Syneresis occurs largely in the first minute after cutting the curd; the rate of liquid separation then falls off. There is a fairly wide range of acidity within which syneresis is al-

most constant but, outside this range, acidity has a strong influence. At high acidities there is also a temperature range of nearly constant syneresis. The yield and quality of curd are also sensitive to such factors as salt content, press conditions, water content and washing. In general, 68 per cent is considered to be the upper limit of water content (less if the curd is to be stored), but dewatering must not be carried too far because the expressed liquid contains 5.5 to 6 per cent solids and the loss would become excessive.

Digest from "Making and Storing Curd," by W. Mohr, *Vorratspflege und Lebensmittelforschung* 1, 28, 1938. (Published in Germany.)

CANNED AND PRESERVED FOODS

Soups Rich in Fat

IN SOUP PREPARATIONS made with meat extract, including bouillon cubes, the creatinine content is a useful criterion of quality with respect to the proportion of genuine meat extract. Bouillon cubes may be made from other meats than beef, for example chicken, but the origin should be stated. A reasonable amount of blending may also be permitted, but when the cubes are dissolved in boiling water if the predominant flavor and aroma are not characteristic of the stated origin, the product may be considered adulterated.

A comparatively recent entry in the list of commercial soup stocks is a type of soup with high fat and low salt content. These preparations may contain, for example, 20 to 35 per cent fat. The fat is not an adulterant, however, for the products are at least as rich in meat extract as the older type, and sometimes richer. Examples include chicken, oxtail and beef stocks, usually with vegetables. Sometimes these soups contain less than the legal standard of total nitrogen, or creatinine, and yet they are not adulterated products. Making a due allowance for the fat content brings them into the acceptable range.

Usually suet is used for the fat, or a large proportion of it, but care is needed to bring out the true flavor of the soup stock, not permitting it to be masked by the taste of suet. In chicken soup, for example, straight chicken fat is unsatisfactory both in consistency and in keeping quality, but it can be blended with suet to overcome these defects and still its flavor can predominate.

Digest from "Composition and Examination of Soup Preparations," by Robert Posega, *Osterreichische Chemiker-Zeitung* 41, 53, 1938 (Published in Vienna).

FATS & OILS

Pineapple to Stabilize Salad Dressings

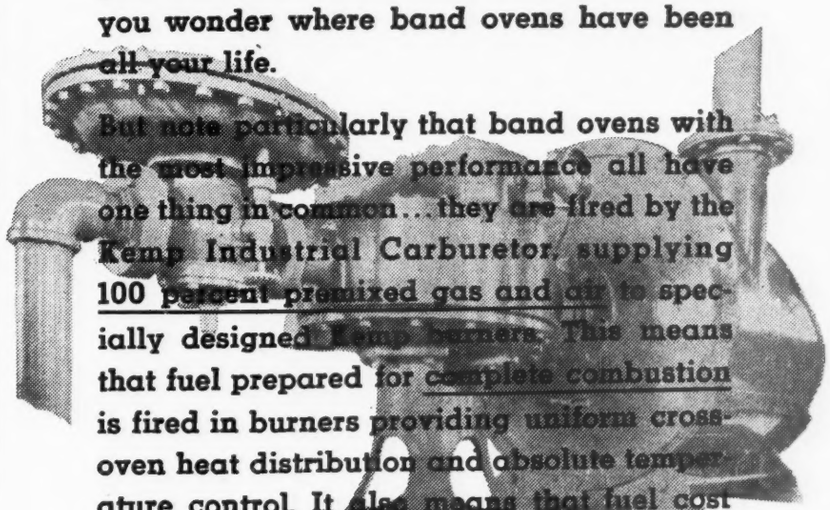
RETARDATION of rancidity as well as improvement in flavor is claimed for the addition of pineaple juice, pulp, or both to salad dressings, particularly of the mayonnaise type.

While the pineapple material in untreated form may be added to the egg yolk, vegetable oil, and vinegar mixture, greater stability of the finished product is obtained if the pineapple constituent is heated at a relatively high temperature for several minutes before being added. Still greater advantages are claimed if the pineapple constituent be heated with an organic acid, such as acetic (vinegar), lactic, citric, or tartaric, at 180 to 185 deg. F. for ten to twenty minutes. The amount of acid added is dependent upon which acid is used and how strongly an acid- and pineapple-flavored final product is wanted.

To a Baker who is

OVEN-SHOPPING

A band oven? By all means. Check into them carefully and you'll find efficiency, economy, production speed and control that will make you wonder where band ovens have been all your life.



But note particularly that band ovens with the most impressive performance all have one thing in common... they are fired by the Kemp Industrial Carburetor, supplying 100 percent premixed gas and air to specially designed Kemp burners. This means that fuel prepared for complete combustion is fired in burners providing uniform cross-oven heat distribution and absolute temperature control. It also means that fuel cost per pound of production will be lower, much lower than you have known before.

Why not have the Kemp story at hand when you go band oven shopping? We'll be glad to send details. Address The C. M. Kemp Manufacturing Company, 405 East Oliver Street, Baltimore, Maryland.

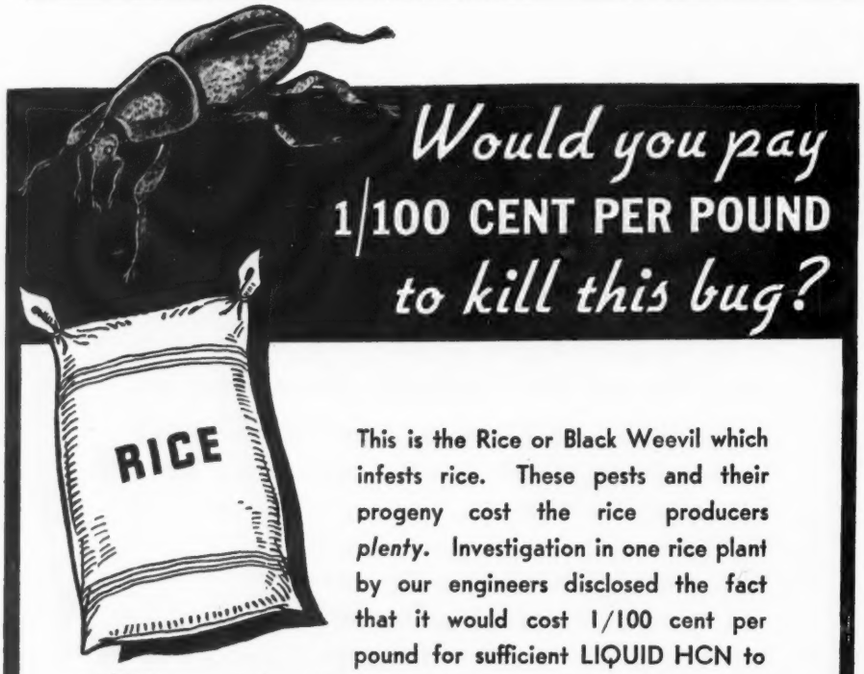
KEMP of BALTIMORE

An acidity of 0.8 to 1.0 per cent will prevent fermentation.

When the mayonnaise type of dressing is being made, 65 parts of pineapple juice is heated with 45 parts of a 10 per cent acid (vinegar), at 180 deg. F. for ten to twenty minutes and cooled before being added to the extent of 10 per cent to the normal mayonnaise ingredients. When ground pineapple is used, the proportions are 960 parts pineapple and 330 parts vinegar 10 per cent acidity. The mixture is heated at 180 to 185 deg. F. for ten to twenty minutes, liquid drained off, and 30 to 35 per cent of the pulp material uniformly worked into the mayonnaise.

For salad dressings in which some kind of starch paste is used, 30 to 50 per cent of acidified pineapple juice may be added to the starch paste itself to give an acidity of 1.4 to 1.7 per cent as acetic acid. From 55 to 60 parts of this starch paste mixture is then added to the mayonnaise emulsion made of 35 parts oil, 5 to 6 parts egg yolk, and other desired spices or mustard.

When desired, the pineapple juice may first be concentrated under vacuum with or without being previously acidified. Also other types of modified mayonnaises may be made in which the pineapple ingredient would serve as a stabilizer as well as a flavor. This method of treating pineapple material and its use are covered by U.S. Patent No. 2,111,766 granted to Simon Gelfand, Los Angeles, Calif.



This is the Rice or Black Weevil which infests rice. These pests and their progeny cost the rice producers *plenty*. Investigation in one rice plant by our engineers disclosed the fact that it would cost 1/100 cent per pound for sufficient LIQUID HCN to obtain a *complete kill* in their bulk rice and 2/100 cent per pound in their packaged rice.

You may produce, or use, such products as rice, flour, raisins, dates, figs, nuts, cocoanut and other foods which are subject to insect infestation. If so, write us for an estimate of the cost of obtaining a complete kill on the particular product you handle.

LIQUID HCN is an all-purpose pest destroyer. It is a powerful, concentrated, economical and efficient fumigant. Completely controls all insects which infest stored products, and kills rats and mice.

The American Cyanamid Company is the only manufacturer of HCN in all its modern forms — LIQUID HCN, ZYKLON DISCOIDS and CYANOGAS.

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FLOUR AND GRAIN PRODUCTS

Dry Malt Extract

A DRY MALT EXTRACT which contains diastase and is exceptionally stable is made with the aid of expedients which, while known in themselves, form a novel combination. As the invention is described in German Patent 655,997 (granted Jan. 27, 1938, to J. Ruckdeschel & Söhne Kommandit-Gesellschaft, Kulmbach, Germany) one ingredient is a water-repelling fat or oil, either paraffin oil or an animal or vegetable fat or oil. Another ingredient is a protective colloid to promote emulsification. This may be gelatin, casein, albumin or globulin.

A diastatic malt wort is prepared in the customary manner, mixed with the specified special ingredients and dried rapidly but cautiously in a dryer of suitable design. As an example, a malt extract containing 50 parts of dry matter is blended with 2.5 to 5 parts gelatin and 2.2 to 4.4 parts water-free margarin, and the resulting mixture is dried. The products obtained in accordance with this invention are useful in baking, or as a base for food items in special diets. They may also be used as textile sizes, in which case their manufacture does not require so much care nor such high quality of materials as for food uses.

MEAT AND MEAT PRODUCTS

Curing Pork

WHERE CONTROLLED TEMPERATURES are not available (as on the farm), dry sugar curing was the more satisfactory method of curing. Where temperature control is possible, 40-45 deg. F. was best. Salt, 8 lb.; sucrose, 3 lb.; saltpeter, 3 oz. was used for this cure and was applied at rate of 1 oz. per pound of bacon (1 rubbing) and 1-1½ oz. per pound of ham (3

rubbings for hams under 20 lb. and 4 rubbings for hams over 20 lb.). This produced mild cured bacon and ham. Seven days per inch of thickness is the minimum time in dry cure. Salt moves fastest from the cushion side of the ham and the rib of the bacon.

The sweet pickle cure required eleven days per inch through the H-bone for 75-deg. salimeter pickle and nine days per inch for 85-deg. pickle. Salt penetration was slightly faster at 45-50 deg. F. than at 34 deg. F.

After a 60-day aging period (after smoking) there was very little difference in shrinkage of pork cured by the dry and sweet pickle methods.

Digest from "Rate of Salt Absorption in Curing Pork," by P. T. Tiegler and R. C. Miller. *Bulletin 355, School of Agriculture and Experiment Station,* The Pennsylvania State College, State College, Pa.

SUGAR

Abnormal Sugar Crystals Still Unexplained

IN PREVIOUS STUDIES of the grain size and crystal structure of beet sugar certain peculiarities, such as the occurrence of twinned needle from crystals and variations in grain size, have been attributed to abnormalities in composition of the beets, or unusual concentration of non-sugars in the refined sugar.

Calcium salts of organic acids have received much of the blame for the observed irregularities. A comprehensive investigation by the statistical method has only partially confirmed the previous conclusions. A critical and analytical study of the many observations made in this investigation indicates that the specific factors which have been considered responsible do not, in fact, have much influence on the morphological character of the sugar crystals.

On the other hand, these results do not rule out the probable existence of non-sugars, their exact nature not yet known, which actually cause those effects still remaining to be explained. In particular, while organic calcium salts are commonly present in varying amounts, it does not appear from a careful examination of the evidence that these salts are responsible for the occasional anomalies in the crystallized sugar. Search for the exact causative agents must be continued.

Digest from "Statistical Study of the Influence of Calcium Salts and Other Factors on Sugar Crystals," by Gabriel Vavrinecz, *Deutsche Zuckerindustrie* 62, 1153, 1937; 63, 87, 107, 1938 (Published in Germany).

MISCELLANEOUS

Glass Marking Ink

THIS "INK" will mark glass. But be careful. It is poisonous.

Barium Sulphate	15 grams
Ammonium Bifluoride	15 grams
Ammonium Sulphate	10 grams
Oxalic Acid	8 grams
Glycerine	40 grams
Water	12 grams

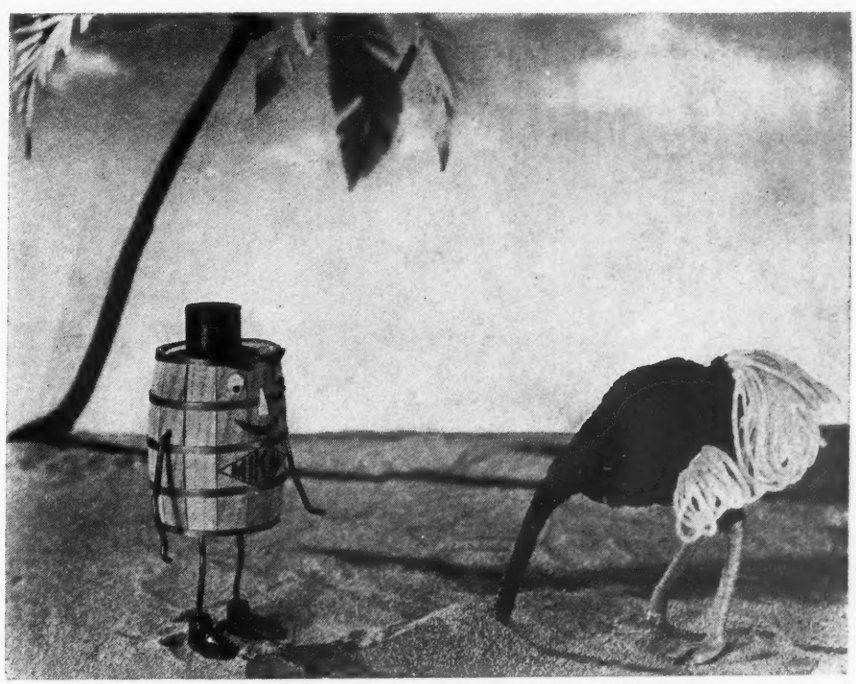
Use only in a laboratory hood or in a well ventilated room. Make up only as needed.

From a bulletin by the Glycerine Producers Association.

Selenium Poisoning

"ALKALI DISEASE" or selenium poisoning of farm livestock, its pathology, and the geographical distribution of selenium containing soils is reviewed in this 91-page bulletin.

"Alkali Disease or Selenium Poisoning," Bulletin 311. Agricultural Experiment Station, Brookings, South Dakota.



Hiding Your Head in the Sand

—seems like a foolish idea, yet its done every day. Consider, for example, the buyer who buys glue on *price alone!*

The reputation of Mikah Glues has been built solely on a quality basis.

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Keep the Spores Out

(*Continued from page* 371)

capable of producing "ropiness" vary somewhat in their resistance to hypochlorites. The data given graphically in Charts I and II show, however, that suspensions of *Bacillus mesentericus* Trevisan, the most resistant species studied by us, are, to all practical purposes, sterilized by one hour's exposure to hypochlorite solutions containing 1,000 parts per million of available chlorine.

Hypochlorite spray is lacking in effectiveness against *B. mesentericus* if used in concentrations of 600 parts per million of available chlorine, as now recommended by hypochlorite manufacturers. If the spray solution contains 1,200 parts per million of available chlorine, then the effectiveness becomes noticeable after two hours' exposure to the spray in a closed cabinet (Fig. 2). Exposure of more than two hours give no additional effectiveness.

Daily use of hypochlorite spray does have a controlling effect on the occurrence of "ropiness" in bread, in as much as spray solutions containing 600 parts per million of available chlorine, as recommended by the hypochlorite manufacturers, do delay the germination of the spores for about 24 hours.

Addition of a very small amount of hydrochloric acid to hypochlorite solutions shows a greatly increased effectiveness of the solutions against spore-forming organisms.[2]

Rinsing solutions containing 0.32 per cent formaldehyde (1 per cent formalin) are impractical for control of "ropiness" in bread, as can be interpreted from Chart III. Such solutions require more than four hours to cause death to 75 per cent of the *B. mesentericus* spores present in the solution. Stronger solutions of formaldehyde were found to be more effective, but they are not suitable for constant use in a bakery because of their effects upon the personnel. Although there may be no permanent deleterious effect, there is at least a temporary discomfort in the form of smarting eyes and difficult breathing caused by solutions containing more than 0.32 per cent formaldehyde.

Fumigation with formaldehyde is ineffective against *B. mesentericus* if the concentrations recommended by the manufacturers of formaldehyde candles are used. For effective fumigation with formaldehyde 3 oz. of formaldehyde candle must be used per thousand cubic feet of space and the bacteria should be exposed to this concentration for at least six hours, as is shown in Fig. 3.

If the bakery equipment is well crusted over with wheat flour alone, there is no marked difference in the effectiveness of the formaldehyde fumigation. But, if this incrustation contains much grease or shortening, the effectiveness is greatly reduced. (Fig. 4.)

The fact that grease does greatly interfere with the germicidal effectiveness of both hypochlorites and formaldehyde emphasizes the necessity of preceding all disinfection operations with a thorough scrubbing of the equipment with ordinary soap and hot water.

In summing up the results of our study on the use of germicides in the bakery we support the conclusions that vinegar cannot be used daily because of its corrosive effect on metallic equipment; that hypochlorites may be used daily to control the development of the bacteria; and that formaldehyde may be used for emergency work in case of serious outbreaks of "ropiness."[3]

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OAKITE CERTIFIED CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

Designing Machines

(*Continued from page 375*)

smooth edge on the top of the tank or vat itself, and a drip lip on the outer edge of the cover, as shown in Fig. 1. Should holes in the cover be necessary, as for inspection, for thermometer insertion, or for passage of an agitator shaft, these holes should be provided with a flanged rim, not less than ⅜ to ½ in. high, as shown in Fig. 2.

Another important point for the designer to consider is the drainage of condensation. In the case of a tap or drain opening, this can easily be taken care of by sloping the surface in which the tap is located. Where a hinged cover is used, the hinge or opening between the cover and the stationary section must be provided with a shield. One design for such a shield is shown in Fig. 3. In any case, the shield must be constructed so as not to allow any drip or condensate to enter, either with the cover open or closed.

In some cases, where covers are of such a size that material of various alloys like stainless steel cannot be obtained in one piece, the welded seam should be ground smooth and polished. At times, however, a welded seam cannot be used and recourse must be had to a lock-seam. In this case, the protruding seam should be smoothed with solder and the corners given a fillet, as is shown in Figs. 4 and 5.

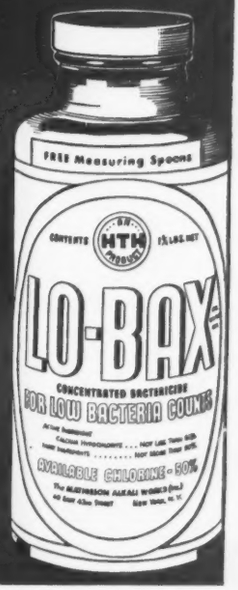
The design of a tank or vat must be given careful thought. Such equipment should be provided with a generous slope in the bottom toward the outlet, to facilitate complete drainage. Where there are sleeves through the sidewalls of a tank, they should be designed for welding or soldering to the inner shell or lining, when the vessel is metal-lined. A glass or porcelain-lined tank necessarily takes a different sleeve construction, generally one where the sleeve is held tight against the lined surface of the tank by a beveled flange, block tin or other gasket and clamp nut, as in Fig. 6. Usually the sleeves, if intended for holding thermometer bulbs, are of small diameter and should not be designed with internal threads, which would make cleaning more difficult. Where other openings, as for agitator shafts, are needed and are located below the liquid level, a more sanitary design is needed. In this case a gland with packing is not satisfactory if a daily dismantling for cleaning is demanded or necessary. It is better to use some sort of rotary seal.

Most food processing machinery is supported on tubular or channel-beam section legs which require adjustment to level up the apparatus so as to compensate for uneven or sloping floors. On pipe legs this is generally accomplished by threading the leg into a casting attached to the bottom of the base. In some cases provision is made for having this thread directly in the base. This, however, is not the best practice from a manufacturing standpoint as such base castings are generally large, cumbersome, heavy to handle and expensive. Also, should the thread be spoiled, a new base piece would be required. Where the design incorporates the thread in a separate piece, these disadvantages are avoided. A skirt to cover any exposed threads on the pipe should also be included, as shown in Fig. 7, as this will improve the appearance considerably.

In conclusion, if the designer combines the principles set down in this article with his own good judgment and experience, it is certain that the design will comply with the most rigid inspection.

CHECK THESE 6 LO-BAX FACTS

1. KILLS BACTERIA QUICKLY
2. DISSOLVES QUICKLY
3. CONTAINS 50% AVAILABLE CHLORINE
4. DOES NOT LOSE ITS STRENGTH
5. EFFECTIVE HOT OR COLD
6. EASY TO USE, LOW IN COST



SPOILAGE losses from bacterial contamination will take an enormous toll of profits in many food plants during 1938. Have you taken steps to safeguard *your* products by means of a rigid sanitary routine coupled with a dependable, quick-acting sterilizer like Lo-Bax? This convenient germ-killer is so economical that you can use it everywhere—on equipment, containers, floors, walls, ceilings. Write us for full information.

The MATHIESON ALKALI WORKS *(Inc.)*
60 East 42nd Street New York, N. Y.
Pioneer Manufacturers of Chlorine Products for Over Forty Years

Anti-Antifreeze

(*Continued from page 383*)

of liquid which will be recycled for maintenance of liquid strength. The whole operation and maintenance of liquid strength is, therefore, made automatic by the setting of the steam valve to the evaporator and the setting of the ball float connected to the circulating pump which serves the concentrator.

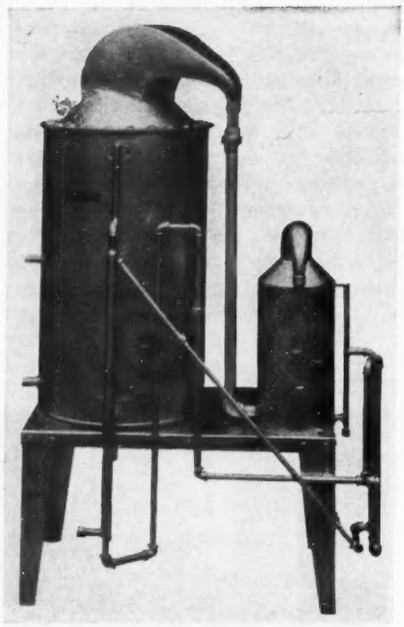
While the process of concentration described above uses steam to furnish the heat to vaporize the water, the concentrator is usually now manufactured using an electric boiler element. Thus the concentrator may be used in places where steam is not available. There is an advantage also due to the fact that for this purpose electricity lends itself more readily to automatic control.

Routine control of the concentrator is maintained by noting the flow of liquids at three points. The quantity of steam being condensed in the little evaporator is evident from the outlet of one cooling pipe where it discharges to drain. The quantity of water evaporated out of the liquid shows at another similar pipe where the condensed vapor discharges to waste. The quantity of liquid being recirculated through the concentrator shows at the point where the reconcentrated liquid is returned to the cooler. Occasional observation of the flow of liquid at these three points suffices to ensure that everything is approximately "normal."

About once a week the plant operator takes a sample of the liquid from the coolers, and by determining its specific gravity makes sure that the concentration has not drifted gradually away from the desired strength. If necessary, the operator will adjust the rates of recirculation or the quantity of steam to the evaporator. Or he may arrange for the addition of make-up chemical as required. Make-up required at this plant is from 1 to 3 gal. per cooler per month, depending on the temperature and humidity prevailing outdoors and the care in operation to prevent any leaks or wastage.

Freedom from shut-downs for the purpose of cleaning out salt encrustations, or other adjustments required as a routine matter with any salt brines, is one of the major advantages noted with this organic anti-freeze. Operating control and the maintenance of uniform conditions in the cold room is easier also because this liquid occasions little irregularity, so long as the liquid strength is properly maintained.

From the several months operation



Concentrator and its piping are arranged as shown in this photograph.

at this plant, local executives believe that significant saving is being made in power, despite more uniform refrigerating conditions. Full capacity is always available, and oversize units are not necessary to offset frost accumulations. No corrosion difficulties have been apparent in this installation with the anti-freeze liquid. The apparent advantage in cost for this anti-freeze liquid, as compared with inhibited salt for brine, is almost a negligible factor compared with the material operating advantage which uniformity gives to the management.

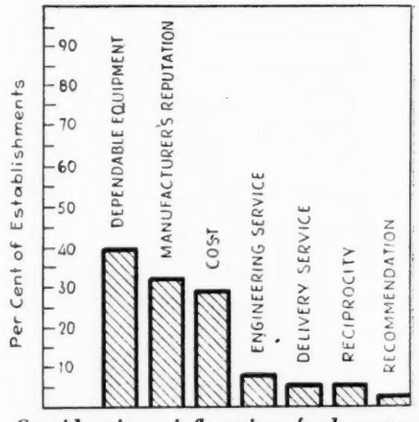
Air Conditioning

(*Continued from page 384*)

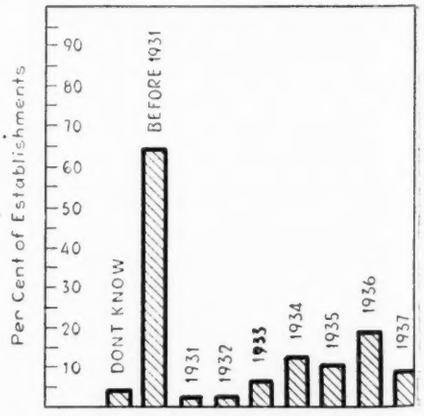
In choosing air conditioning equipment, it was found that the food industries are influenced chiefly by three considerations: the need for dependable equipment; the reputation of the equipment manufacturer; and the cost of the equipment. Contrary to what some might have expected, cost was given the least consideration of the three, with dependability well out in the lead as the foremost requirement.

Perhaps the most important fact brought out by the study was the relative age of the various installations analyzed. Of these, 64 per cent had been made prior to 1931, 58 per cent since that date, with only 8 per cent in 1937 and 18 per cent in 1936. These figures total more than 100 per cent because some plants have more than one air-conditioning installation. Hence the figures mean that 64 per cent of the plants had made installations before 1931, 18 per cent made installations in 1936, and so on. These figures serve to demonstrate that the installation of air-conditioning equipment by the food industries occurred before the depression and that, consequently, much of the equipment now in use is obsolescent and subject to replacement.

When the percentages just given are considered alongside of the fact that only 52 leading food plants out of 96 studied had any air conditioning at all, it is immediately evident that food manufacturers have been slow to take advantage of the great importance of air conditioning as a tool of quality food manufacture (see FOOD INDUSTRIES, June, 1936, an issue devoted to a series of articles describing the various ways in which air conditioning has proved to be useful in the food industries). Much ground, apparently, must still be covered before the food industries as a whole decide to reap the benefits that flow from the correct application of air conditioning to their operations.



Considerations influencing food manufacturers when selecting air-conditioning equipment. Some manufacturers were influenced by more than one reason.



When air-conditioning equipment was purchased. Note that total is over 100 per cent because some plants made more than one purchase.

Transporting Frozen Foods

(*Continued from page 386*)

standard of quality due to uncertain temperature controls and the resulting purchase of unsatisfactory frozen foods by consumers.

Although quick frozen foods have not been shipped in quantities by boat from coast to coast, inland waterway shipments may play a role in frozen food transportation. As reported in FOOD INDUSTRIES, May, 1938, a refrigerator barge built to carry 350,000 lb. of frozen foods, equipped with diesel-driven refrigerating machinery, is to be operated experimentally by the University of Tennessee and the TVA covering the river ports of the Mississippi Valley and the entire Great lakes area.

One of the few problems of frozen food transportation is the shipment of samples in less than carload lots, small lot shipments to institutions well-removed from regular distribution channels, and drop shipments on long hauls. Another problem, minor at present, will be important as frozen foods are imported and exported in and out of the country by water. This problem arises from the necessity of maintaining temperature on unrefrigerated lighters, operating between dock and ship holds, and in many cases in maintaining temperature in transit from one country to another by boat. Shipping containers for transporting less than carload lots of frozen foods are, however, available.

Among these is the Church Freight Service, Inc., container, an insulated container which maintains reduced temperatures either with solid carbon dioxide or mechanical refrigeration equipment. Temperature is thermostatically controlled to a variation of between 2 and 3 deg. F. Capacities vary from 500 to 3,000 lb. of frozen food per container. This type of container is used for less than carload shipments by express, by truck for drop shipments over long hauls, for lighter service, between boat and warehouse, and on board vessels without low temperature holding rooms.

This type of container has been successfully used to transport frozen halibut liver from Norway to Rochester, frozen pineapple from Puerto Rico to New York City, assorted frozen foods from New York City by boat to New Orleans, frozen shrimp from New Orleans to New York, and from New York to Chicago, frozen strawberries from Jacksonville, Fla., to New York, frozen fruits from St. Louis to New York, frozen vegetables from Dyersville, Tenn., to New York and Chicago. When solid carbon dioxide is used to maintain temperature in this type container, 2 to 3 lb. of solid carbon dioxide are consumed per ton-hour to maintain a temperature below +10 deg. F.

Car-lot Receipts of Fruits and Vegetables in 38 Cities, 1936 [1]

City	Total Car-lot Receipts	Car-lot Receipts by —			Percentage of Car-lots Received by —		
		Rail	Boat	Truck	Rail	Boat	Truck
	Cars	*Cars*	*Cars*	*Cars*	*Per Cent*	*Per Cent*	*Per Cent*
Atlanta	15,656	4,473	.....	11,183	28.6	....	71.4
Baltimore	30,995	11,470	2,025	17,500	37.0	6.5	56.5
Boston	56,587	36,984	1,603	18,000	65.4	2.8	31.8
Buffalo	14,995	65,839	.....	6,700	55.3	....	44.7
Chicago	82,298	64,839	.....	16,459	80.0	....	20.0
Cleveland	33,303	16,303	.....	17,000	49.0	....	51.0
Columbus	9,000	5,000	.....	4,000	55.6	....	44.4
Denver	9,600	5,700	.....	3,900	59.4	....	40.6
Detroit	43,011	23,497	14	19,500	54.6	....	45.4
Fort Worth	3,467	1,967	.....	1,500	56.7	....	43.3
Hartford	6,566	3,860	56	2,650	58.8	.8	40.4
Houston	6,600	4,100	625	1,875	62.1	9.5	28.4
Indianapolis	9,250	5,250	.....	4,000	56.8	....	43.2
Jacksonville	4,700	1,700	400	2,600	36.2	8.5	55.3
Kansas City	15,768	12,868	.....	2,900	81.6	....	18.4
Los Angeles	68,948	11,530	357	57,061	16.7	.5	82.8
Milwaukee	10,741	8,408	184	2,149	78.3	1.7	20.0
Minneapolis	19,293	9,176	.....	10,117	47.6	....	52.4
Newark	28,974	9,019	1,705	18,250	31.1	5.9	63.0
New Haven	8,607	3,342	.....	5,265	38.8	....	61.2
New Orleans	10,200	3,860	1,840	4,500	37.9	18.0	44.1
New York	203,336	98,519	25,901	78,916	48.5	12.7	38.8
Norfolk	3,563	1,231	536	1,769	34.6	15.8	49.6
Oklahoma City	9,493	3,353	.....	6,140	35.3	....	64.7
Omaha	7,184	5,059	.....	2,125	70.4	....	29.6
Philadelphia	69,923	34,000	4,365	31,558	48.6	6.3	45.1
Pittsburgh	30,759	25,809	.....	4,950	83.9	....	16.1
Portland, Ore	9,500	4,997	3	4,500	52.6	....	47.4
Providence	10,432	5,458	126	4,848	52.3	1.2	46.5
Rochester	8,000	3,000	.....	5,000	37.5	....	62.5
St. Louis	24,677	22,347	.....	2,330	90.6	....	9.4
St. Paul	10,955	3,555	.....	7,400	32.5	....	67.5
Salt Lake City	6,154	1,634	.....	4,520	26.6	....	73.4
San Diego	4,718	1,218	47	3,453	25.8	1.0	73.2
San Francisco	23,038	7,693	1,147	14,198	33.4	5.0	61.6
Seattle	11,312	4,938	374	6,000	43.7	3.3	53.0
Springfield, Mass	5,586	3,724	.....	1,862	66.7	....	33.3
Washington	13,913	5,674	239	8,000	40.8	1.7	57.5
Total	962,344	506,092	41,574	414,678	51.5	4.4	44.1

[1] Excluding bananas. Does not include diversions.

BOOKS RECEIVED

UTILIZATION OF FRUIT IN COMMERCIAL PRODUCTION OF FRUIT JUICES. Circular 344. By M. A. Joslyn and G. L. Marsh. Published by University of California College of Agriculture, Agricultural Experiment Station, Berkeley, Calif., 1937. 63 pages; 6x9¼ in.; paper.

This gives tables on composition of some juices, and covers methods of extraction; straining, filtration and clarification; metallic contamination; preservation processes; bottling or canning; canned pulpy fruit-juice beverages; canned orange dairy base; retention of vitamin C in fruit juices; carbonation of fruit juices; fruit-juice syrups; fruit-juice concentrates; yields of various fruits; and plant sanitation.

VITAMIN CONTENT OF FOODS. A SUMMARY OF THE CHEMISTRY OF VITAMINS, UNITS OF MEASUREMENT, QUANTITATIVE ASPECTS IN HUMAN NUTRITION AND OCCURRENCE IN FOODS. MISCELLANEOUS PUBLICATION No. 275. By Esther Peterson Daniel and Hazel F. Munsell, Bureau of Home Economics. 175 pages. Price 15 cents; for sale by the Superintendent of Documents, Washington, D.C.

This document contains tabulations from all the likely source material on the vitamin content of foods, which had been published up to Jan. 1, 1936. Research laboratories and advertising agencies please note.

DIRECTORY OF ASSOCIATION MEMBERS, ASSOCIATION OF CONSULTING CHEMISTS AND CHEMICAL ENGINEERS, INC., 50 E. 41st St., New York, N.Y., 1938. 60 pages, 8½x11 in.; paper. Free. This directory is so arranged that anyone with a research or testing problem can find listed under the type of work which he wants done the names and addresses of chemists and engineers qualified to do the job.

BACTERIAL CONTENT OF MILK AS AFFECTED BY THE USE OF DIFFERENT PLATING METHODS. Bulletin 4170. By Alec Bradfield. Published by Vermont Agricultural Experiment Station, Burlington, Vt., 1937. This bulletin points out how agar plates affect the bacterial count.

A STATISTICAL COMPARISON OF TWO METHODS FOR DETERMINING THE BACTERIAL COUNT OF MILK. Bulletin 423. By J. M. Frayer. Published by Vermont Agricultural Experiment Station, Burlington, Vt., 1937. 19 pages; 6x9 in.; paper. This has to do with a comparison between the standard method of obtaining bacterial counts and a modified method (Bowers-Hucker medium inoculated at 32 deg. C.).

HOW TO KEEP ACCOUNTS AND PREPARE STATEMENTS. By Earl A. Saliers, Louisiana State University. Published by Ronald Press Co., 15 E. 26th St., New York, N.Y., 1938. 481 pages; 5¾x8¼ in.; cloth. Price $3.

Much of the mystery will be taken out of accounting practices and procedures for the non-accountant who reads this book, because it is written specifically for those who do not have, but want to acquire, a practical understanding of accounting. The principles of accounting are made to seem logical and relatively simple. Illustrative problems of a practical type are included, together with their solutions, to aid the reader who sets out to grasp a working knowledge of accounting without the aid of an instructor.

Many executives in the food industries, as well as bookkeepers, will find the book helpful in giving them a better understanding of one of the basic principles of successful business management, the recording in organized, classified and interpretable form of the multiplicity of details incidental to the operation of a business.

PATENTS

Apple Butter Converted to Dry Powdered State Through Combined Use of Evaporation, Freezing, Grinding While Frozen, Reheating With Subsequent Freezing and Regrinding—Phares S. Brubaker, Sterling, Ohio. No. 2,115,191. April 26, 1938.

Bread Wrapped in an Outer Waxed-Coated Transparent Sheet Having Decorative Design Superimposed on a Foil Sheet Kept From Direct Contact With the Bread by an Inner Wrapping—Shy Rosen, Flushing, N. Y. No. 2,115,318. April 26, 1938.

Dried Prunes Canned so as to Retain Fruit Sugars and Volatile Constituents—Walter R. Campbell and Vincent B. Alling, Vancouver, Wash. No. 2,115,382. April 26, 1938.

Yerba Maté Processed for Beverage Use by Wetting Leaves and Twigs of Plant With Solution of Edible Alkali Preliminary to Drying—Joseph Cortes, to Clarence H. Venner, Jr., New York, N. Y. No. 2,115,411. April 26, 1938.

Pectin Treated to Produce Semi-Soluble and Dispersible Calcium Pectinate—Neal M. Beach, Fairport, N. Y. to General Foods Corp., New York, N. Y. No. 2,115,479. April 26, 1938.

Rolls of Dough Twisted by Mechanical Means—Harry J. Criner, one-half to A. G. Bush, Davenport, Iowa. No. 2,115,572. April 26, 1938.

Sausage Casings Made From Plastic Kneadable Mass of Animal or Vegetable Fibers Without a Carrier to Keep Fibers Intact—Oskar Walter Becker, Heidelberg, Germany, to Naturin Gesellschaft mit beschrankter Haftung, Weinheim-B., Germany. No. 2,115,607. April 26, 1938.

Soya Oil Separated From Refining and Washing Solution Reagent by Centrifuging—Edward M. James, Moylan, Pa., to The Sharples Specialty Co., Philadelphia, Pa. No. 2,115,668. April 26, 1938.

Egg Meats Freed From Undesirable Substances and Masses by Being Forced Under Mechanic Pressure Through Perforations in Container—Frank B. Lomax, Chicago, Ill. Nos. 2,115,728 and 2,115,730. May 3, 1938.

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Mechanical Means for Depositing Confections on Wafers—John Brandt, Chicago, to Salerno Machinery Co., Chicago, Ill. No. 2,115,799. May 3, 1938.

Berries and Vegetables Separated Into Liquid and Insoluble Portions Preliminary to Concentration of Liquid Portion and Subsequent Recombining With Insoluble Solids—David L. Johnson, Glenside, Pa. No. 2,115,815. May 3, 1938.

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Butter in Bar Forms Grouped Into Rectangular Block Packages Formed by Wax Coated Wrapping Material and Heat Sealed—Albert Lowenfels, White Plains, N. Y. No. 2,115,977. May 3, 1938.

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Coffee Extract Prepared by Two-Stage Water Extraction of Finely Ground Roasted Coffee—Herbert C. Gore and Charles N. Frey, Scarsdale, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,116,308. May 3, 1938.

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